

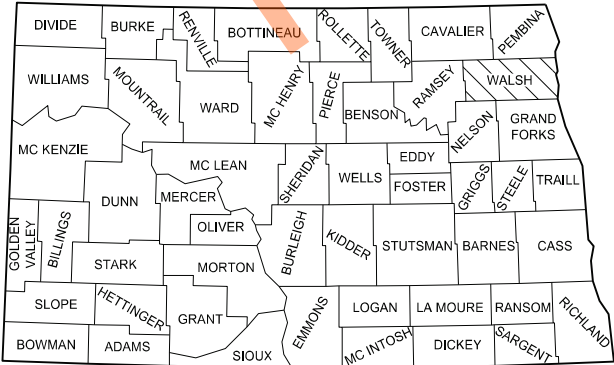
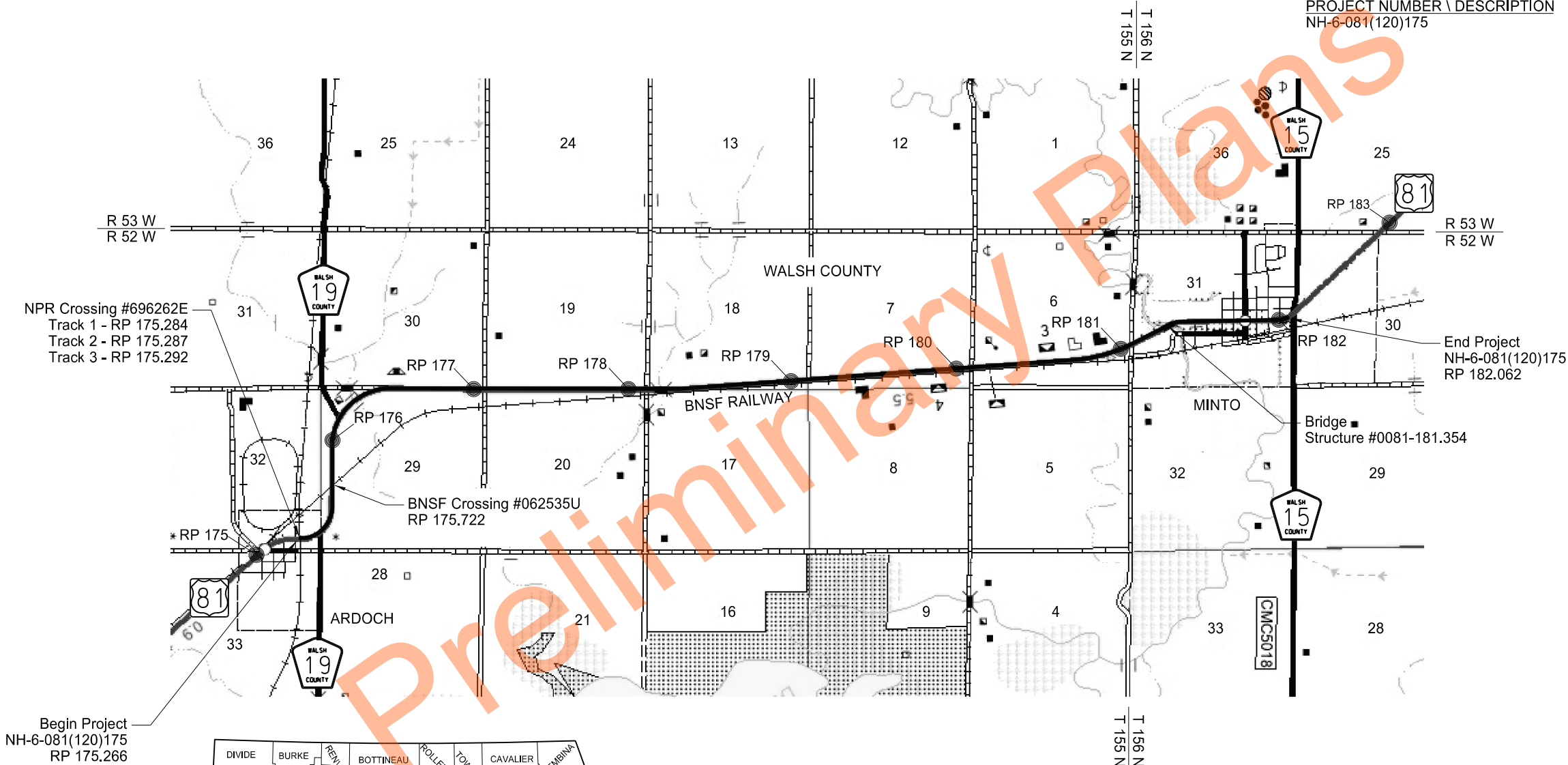
DESIGN DATA				
Traffic		Average Daily		
Current	2024	Pass: 1,627	Trucks: 250	Total: 1,877
Preventive Maintenance				

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

NH-6-081(120)175
Walsh County
Ardoch N thru Minto
Milling & HMA, ADA Curb Ramp Revisions

GOVERNING SPECIFICATIONS	Date Published and Adopted by the North Dakota Department of Transportation
Standard Specifications	7/1/2025
Supplemental Specifications	NONE

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
NH-6-081(120)175	6.796	6.796



STATE COUNTY MAP

DESIGNER Lynnette Steyn
DESIGNER
DESIGNER

ND DEPARTMENT OF TRANSPORTATION
GRAND FORKS DISTRICT
[Signature] 5/01/26

GRAND FORKS DISTRICT

REGISTERED PROFESSIONAL ENGINEER

DUSTIN LANG

PE-6394

DATE 05/01/26

NORTH DAKOTA

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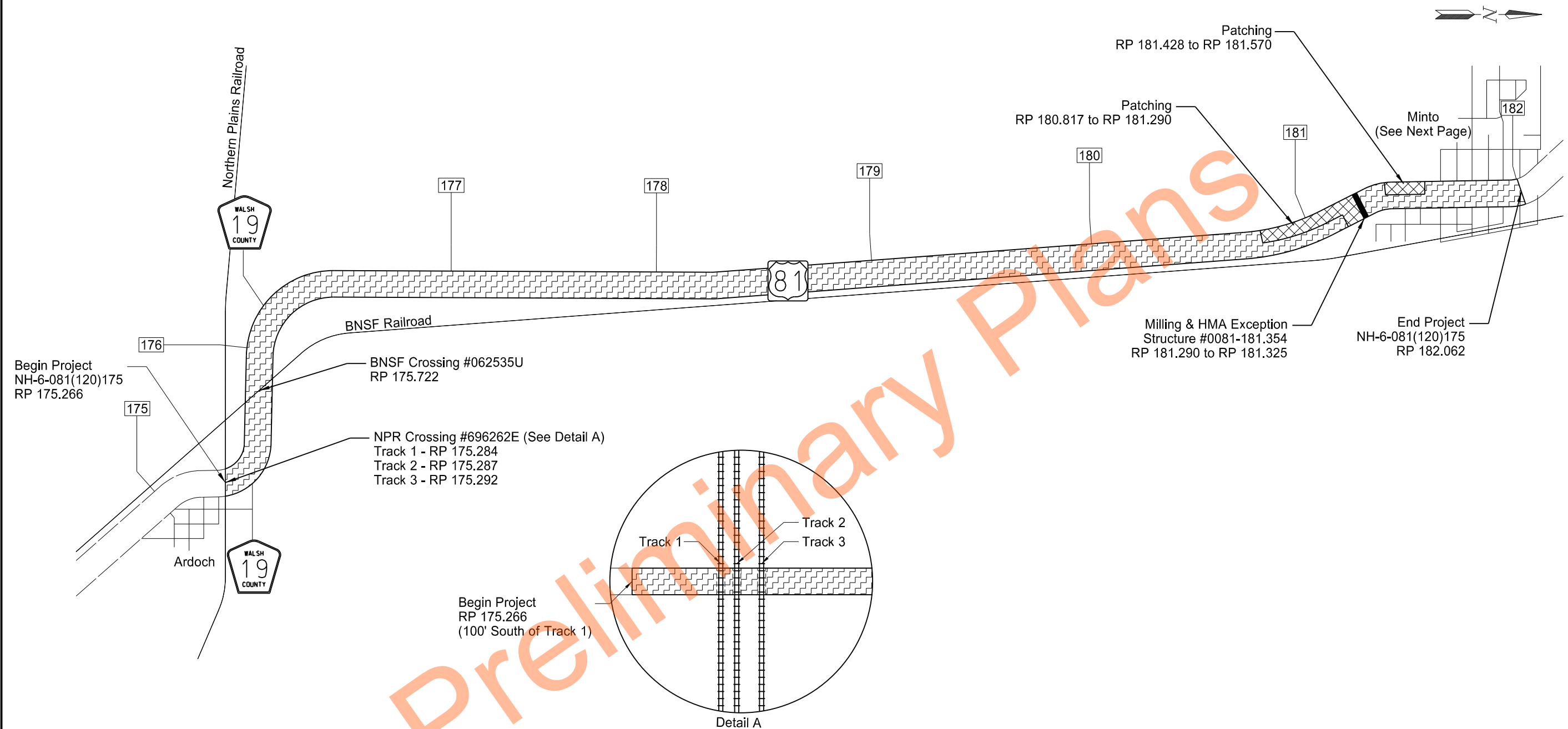
PLAN SECTIONS			SPECIAL PROVISIONS	
Section	Page(s)	Description	Number	Description
1	1	Title Sheet	PSP 60(25)	Permits and Environmental Considerations
2	1 - 2	Table of Contents	SP 379(25)	Utility Coordination
4	1 - 2	Scope of Work	SP 411(25)	Railroad Coordination BNSF
6	1 - 3	Notes	SP 412(25)	Railroad Coordination NP
8	1 - 2	Quantities	SP 420(25)	Railroad Coordination CPKC
10	1 - 3	Basis of Estimate	SP 428(25)	E-Ticketing (Mandatory)
20	1 - 8	General Details	SP 429(25)	Intelligent Compaction for HMA
30	1 - 6	Typical Sections	SP 430(25)	Paver Mounted Thermal Profiler
40	1 - 7	Removals	SP 431(25)	Flexible Pavement Surface Tolerance
77	1 - 7	Permanent Erosion Control	SP 432(25)	Percent Within Limits
80	1 - 7	Layouts	SP 433(25)	Temporary Pedestrian Facilities
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120	1 - 4	Pavement Marking		

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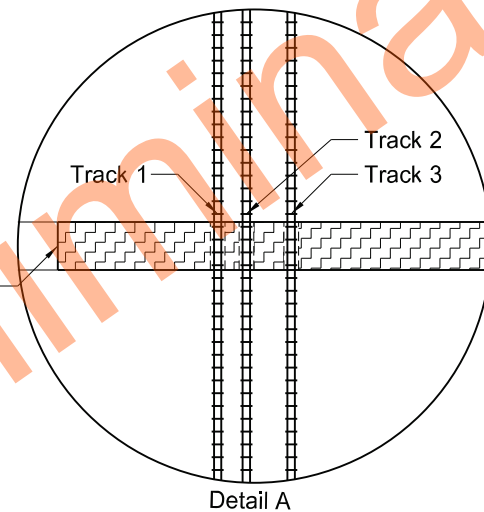
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Number	Description	Number	Description
D-101-1, 2,3,4	NDDOT Abbreviations		
D-101-10	NDDOT Utility Company and Organization Abbreviations		
D-101-20, 21	Line Styles		
D-101-30, 31,32,33	Symbols		
D-704-2	Traffic Control For Coring Of Hot Bituminous Pavement		
D-704-7	Breakaway Systems For Construction Zone Signs - Perforated Tube		
D-704-8	Breakaway Systems For Construction Zone Signs - U-Channel Post		
D-704-9	Construction Sign Details - Terminal And Guide Signs		
D-704-10	Construction Sign Details - Regulatory Signs		
D-704-11, 11A	Construction Sign Details - Warning Signs		
D-704-13	Barricade And Channelizing Device Details		
D-704-14	Construction Sign Punching And Mounting Details		
D-704-15	Road Closure Layouts		
D-704-20	Terminal And Seal Coat Sign Layouts		
D-704-22	Construction Truck And Temporary Detour Layouts		
D-704-26	Miscellaneous Sign Layouts		
D-704-27	Mobile Operation (Pavement Marking)		
D-704-33	Two-Lane Roadway Portable Rumble Strips		
D-704-50	Portable Sign Support Assembly		
D-704-56	Mobile Operation - Grinding Shoulder Rumble Strips		
D-706-1	Bituminous Laboratory		
D-722-5	Manhole Details		
D-748-1	Curb & Gutter And Valley Gutter		
D-750-2	Sidewalk		
D-750-3	Curb Ramp Retrofit Details		
D-750-4	Curb Ramp Retrofit Transitional Area Details		
D-760-3	Rumble Strips Undivided Highways (Shoulders 4' Or Greater)		
D-762-1	Pavement Marking Message Details		
D-762-4	Pavement Marking		
D-762-11	Short-Term Pavement Marking		

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- 2" Milling & 2" RAP - Superpave FAA 43
- Patching, 2" Milling & 2" RAP - Superpave FAA 43



Scope of Work

Milling & HMA, ADA Curb Ramp Revisions
Ardoch N thru Minto

REGISTERED PROFESSIONAL ENGINEER

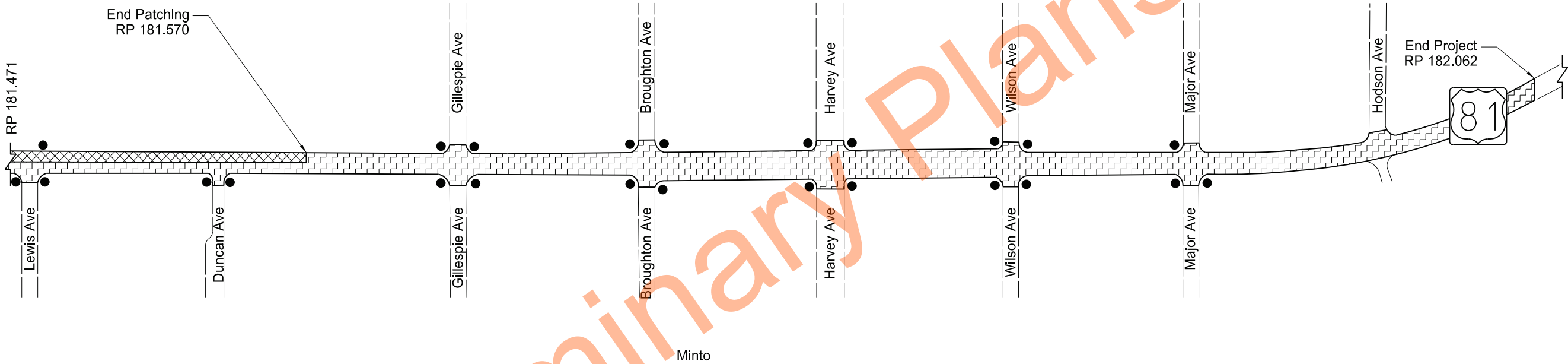
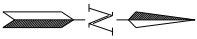
DUSTIN LANG

PE-6394

DATE 04/24/26

NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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-  2" Milling & 2" RAP - Superpave FAA 43
-  Patching, 2" Milling & 2" RAP - Superpave FAA 43
-  ADA Curb Ramp Revision

Scope of Work
ADA Curb Ramp Revision Locations

Milling & HMA, ADA Curb Ramp Revisions
Ardoch N thru Minto



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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NOTES

- 100-P01 MINTO DAYS: Minto Days is scheduled for 2nd or 3rd weekend in June. Contact the City of Minto at (701)-248-3858 prior to beginning work in the city and project limits to verify the dates.
- Coordinate work so that US 81 is completely open to traffic & pedestrians. Move all traffic control from downtown Minto off the project to an area approved by the Engineer a minimum of 1 day before the event.
- No work will be allowed during Minto Days within the city and project limits.
- 100-P02 PUBLIC NOTIFICATION: Provide written notices to each property and business adjacent to the perimeter of the project limits a minimum of 7 days in advance of work. Include proposed start/end date of construction, description of construction activities (Milling, Paving, ADA Ramps, etc.), and general schedule of activities for the project from start to end. Prior to delivering notices, submit notice to the Engineer for approval.
- 100-P03 ORDER OF OPERATION:

1. ADA Curb Ramp Revisions

2. Milling

3. Patching

4. HMA (RAP – Superpave FAA 43)
- 105-P01 The Engineer will establish centerline prior to milling if requested by the Contractor. No additional horizontal control will be provided.
- 105-P02 PROTECTION OF UTILITIES: Cover and protect all manholes, catch basins and appurtenances from milling and HMA operations.
- 107-P01 MAINTAIN PUBLIC ACCESS: The Minto City Park does not have secondary access. Access to the Minto City Park must be maintained at all times during construction.
- 107-P02 PAVEMENT SWEEPING: Sweep the roadway within Minto using a vacuum or pickup type sweeper. Perform sweeping after ADA Curb Ramp revisions and prior to opening them to the public. Perform sweeping after milling & HMA operations.
- 107-P03 MAINTAINING TRAFFIC - DROP-OFFS: If, at the end of the workday, drop-offs greater than 2 inches and less than 18 inches or slopes steeper than 4:1 exist between the edge of a traffic lane and the outside edge of the proposed roadway, perform one of the following actions:

Construct a traversable wedge in the area of the drop-off or steep slope; or

Close the lane adjacent to the drop-off or steep slope and provide 24-hour flagging operations.

When constructing a wedge, construct a wedge composed of aggregate or earthen materials with a 4:1 or flatter slope along the entire length of the area. Compact materials using Type C compaction, as specified in 203.04 G.4, "Compaction Control Type C".

Install stackable vertical panels that meet the requirements of Section 704.03 H, "Stackable Vertical Panels", along the edge of the driving lane closest to the wedge.

The Engineer will measure stackable vertical panels as specified in Section 704.05, "Method of Measurement" and will pay for panels as specified in Section 704.06, "Basis of Payment".
- The Engineer will not measure material used to construct the wedge. Include the cost of materials, equipment, labor, and incidentals required for this operation in the price bid for other pay items.

If a 4:1 or flatter wedge is not installed, provide 24 hour flagging operations and associated traffic control at no additional cost to the Department.

The requirements of Section 704.04 O, "Traffic Control for Uneven Pavement" apply to drop-offs created by milling or the placement of hot mix asphalt.
- 202-P01 REMOVALS (ADA CURB RAMP REVISIONS): Removal and disposal of existing aggregate (if needed) or common excavation is included in the costs of "REMOVAL OF CONCRETE PAVEMENT" or "REMOVAL OF CURB AND GUTTER".

202-P02 REMOVAL OF CONCRETE PAVEMENT: Removal of concrete pavement consists of removing sidewalks and aggregate base.

202-P03 REMOVAL OF CONCRETE PAVEMENT: When work begins at the NE quadrant of Harvey Ave and 2nd Street, contact the City of Minto to coordinate the elevation adjustment of the valve access cover as shown on Section 40 Sheet 5.

202-P04 REMOVAL OF CONCRETE PAVEMENT: Remove street sign and support on the NE quadrant of Broughton Ave and 2nd Street as shown on Section 40 Sheet 4. Deliver the removed street sign and support to the City of Minto Public Works at 621 2nd Street. Replace removed sign or support if damaged during removal at no additional cost to the Department or City of Minto. Include the cost in the unit price bid for "REMOVAL OF CONCRETE PAVEMENT".

202-P05 REMOVAL OF BITUMINOUS SURFACING: Removal of bituminous surfacing has been estimated as 2FT width x 7IN depth to accommodate the removal and replacement of curb & gutter and valley gutter.

Include costs for all removals, including aggregates or embankment beneath the bituminous surfacing in the unit price bid for "REMOVAL OF BITUMINOUS SURFACING".

302-P01 AGGREGATE BASE COURSE CL 5: 50 tons Aggregate Base Course CI 5 has been provided in the quantities to fill in around the radii of approaches. This material will be required when sloughs are steeper than 4:1 and at the direction of the Engineer.

411-P01 TEMPORARY ASPHALT WEDGES: Place temporary asphalt wedges at the beginning and end of this project, intersecting routes and beginning and end of the patch locations to allow smooth passage of vehicles at these locations. Place wedges at these milled areas prior to the traffic being allowed back on the milled roadway section. Millings may be used instead of asphalt for all wedges. Include all costs associated with labor, materials, and equipment for the installation, maintenance and removal of the wedges in the contract price bid for "MILLING PAVEMENT SURFACE".
- A circular professional engineer seal for Dustin Lang, PE-6394, North Dakota. The seal includes the text "REGISTERED PROFESSIONAL ENGINEER", "DUSTIN LANG", "PE-6394", "DATE 04/29/26", and "NORTH DAKOTA". There is a signature over the name.
- 4/29/2026 1:22:30 PM R:\project\60081175.120\District\Sheets\006NT_Notes\006NT_001_notes.docm

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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NOTES

411-P02 MILLING PAVEMENT SURFACE: Completely remove the depth of bituminous surfacing shown in the typical sections for milling pavement surface around all manholes, appurtenances, and concrete utility/inlet box-outs. Refer to Section 20, Sheet 3 for details.

Include all costs associated with this work in the contract price for "MILLING PAVEMENT SURFACE".

411-P03 MILLING ADJACENT TO ADA CURB RAMPS: Completely remove bituminous surfacing the depth of the proposed paving up to the curb ramp where the pedestrian route intersects the approach.

430-200 FOG SEAL: Apply a fog seal at a rate of 0.05 Gal/SY to the final surface of the hot mix asphalt if the ND T 113 "Lightweight Pieces in Virgin Aggregate" test results exceed 3.0% during mix design or production of the hot mix asphalt. Apply the fog seal behind the finish roller before the mat temperature drops below 130 degrees Fahrenheit. Use the same emulsion material as the Tack Coat. Apply the fog seal at no additional cost to the Department.

430-P01 HMA ADJACENT TO ADA CURB RAMPS: Place HMA adjacent to curb ramps in a manner so that the HMA abuts the curb ramp and the surfacing is flush with the curb ramp.

430-P02 HMA LONGITUDINAL JOINTS: Construct the joints within the final lift of pavement as detailed within this note for Typical Sections 2-6.

Place a longitudinal joint at the centerline of the roadway.

Construct each lane and the adjoining shoulder or turn lane within the curb and gutter section in Minto and the curves at the junctions of Walsh County 19 using a single pass or a hot seam. A hot seam is defined as follows:

- Constructed using two pavers simultaneously;
- No more than 300 feet between pavers; and
- Roll the seam between paver passes in a manner such that the seam is not visible.

430-P03 PROTECTION OF UTILITIES: Protect manholes, catch basins, and valves during the HMA paving operations. Protect monuments that are not shown within the limits of the HMA paving operations shall be protected.

704-500 PORTABLE RUMBLE STRIPS (PRS): Use PRS made of rubber or engineered polymers.

Install PRS as part of the temporary traffic control when the following signs are also part of the required traffic control set up:

- "Be Prepared to Stop" (W3-4); and
- "Flagger" symbol (W20-7)

Install PRS that meet the following criteria:

- Have no adhesives or fasteners required for placement;
- Have a manufacture's speed rating that meets or exceeds the posted speed limit; and
- Each strip in the array must weigh a minimum of 100 pounds.

Use individual PRS constructed in one of the following manners:

- A single piece;
- Interlocking segments; or
- Two pieces hinged at the midpoint.

An installed array of PRS consists of a minimum of 3 individual strips.

Move rumble strips with the flagging operation. Do not place rumble strips on horizontal curves. The Engineer will count and measure each array as one unit. Include the cost of providing, installing, maintaining, and relocating PRS in the unit price bid for "PORTABLE RUMBLE STRIPS".

704-P01 TRAFFIC CONTROL FOR MILLING, HMA, AND PATCHING: Provide traffic control consisting of a temporary road closure, flagging, and a pilot car.

Traffic control device quantities are based on the project length and the list below. The Department will pay for all necessary deployed devices.

1. Standard D-704-15, Type A;
2. Standard D-704-20, Type G – signing will be required at junctions: Walsh County 19 West & East, 55th Street Northeast, and Ordway Ave West & East;
3. Standard D-704-22, Types K and L;
4. Standard D-704-26, Types CC, EE, and GG; and
5. Standard D-704-33.

Place flaggers and traffic control devices as shown on Standard D-704-15, layout A at the following intersections when the lane closure spans across them:

1. Walsh County 19 West & East
2. 55th Street Northeast
3. Ordway Ave West & East

704-P02 TRAFFIC CONTROL FOR PATCHING: Traffic will not be allowed to run on the base overnight. Place at least 1 lift of HMA before allowing traffic on a repair or continue flagging.

704-P03 TRAFFIC CONTROL PHASING: Traffic control phasing is to be followed when constructing the project unless an alternate traffic control phasing plan is submitted to the Engineer for review and approval at least 1 week in advance of the proposed work.

704-P04 SIDEWALK CLOSURES: Traffic control and accessibility devices have been provided based on 12 concurrent work locations.

706-P01 BITUMINOUS LABORATORY: Provide cellular internet service with Wi-Fi capabilities. Also provide a cell phone signal booster that allows for the reliable use of cellular voice and data services throughout the lab. Include all costs for installation and monthly fees for the cellular internet service and cellular signal booster in the contract price for "BITUMINOUS LABORATORY".



NOTES

708-P01 INLET PROTECTION-SPECIAL: Furnish, install, and maintain (clean) drainage inlet filter assemblies to collect sediment in surface storm water runoff. Dispose of debris or silt that has accumulated in the bag. Periodic cleaning of the filter is needed as necessary. Remove drainage inlet filter when vegetation has established.

Provide Wimco, Lange IPD, Flexstorm, Dandy Curbsack, or an approved equal.

Keep filter in place until after the gradient surfaces are stabilized and the surrounding street is clean of debris. Include all costs related to the material, installation, maintenance, replacement, and removal in the price bid for "INLET PROTECTION-SPECIAL".

722-P01 ADJUST MANHOLE: Adjust or modify the manhole and casting so that the casting matches the roadway cross slope and sits between 1/4" and 5/8" below the surface. This may require removal of bituminous surfacing around the casting.

Include all costs to remove and reset the casting, modify the manhole, remove and patch surfacing material in the contract price for "ADJUST MANHOLE".

750-P01 SIDEWALK AGGREGATE: Provide aggregate needed to grade sidewalk base meeting specifications of "AGGREGATE BASE COURSE CL 5".

Include all costs associated with aggregate in the unit price bid for "SIDEWALK CONCRETE 4IN".

750-P02 SIDEWALK CONCRETE: Construct sidewalk and ADA ramps as per Standard Drawings D-750-2, D-750-3, and as shown on the detail layouts in Section 80.

At replacement areas, excavate material to accommodate the proposed aggregate base and dispose of excess excavation.

Place a #3 deformed reinforcing bar placed 24 inches on center both longitudinally and transversely in all replacement areas. Use bars 6 inches shorter than the width of the slab and placed accurately at one-half the depth of the slab. Use plastic chairs. Construct contraction joints according to D-750-2. Place one-half-inch expansion joints as directed by the Engineer.

Saw all longitudinal and transverse contraction joints. Saw joints in a timely manner to prevent any uncontrolled random cracking. If random cracking occurs, remove and replace all damaged panels.

Include the cost of materials, equipment, and labor to perform the above referenced work in the contract unit price for "SIDEWALK CONCRETE 4IN".

762-050 PAVEMENT MARKING: If the Engineer and Contractor agree, plan quantity will be used as the measurement for payment for pavement marking items.

970-P01 LANDSCAPE PREPARATION: Areas requiring "LANDSCAPE PREPARATION" have been designated in Section 77 and will include grading, topsoil, seeding, hydraulic mulch, and watering

Remove topsoil and earth necessary for placement of new sidewalk concrete, curb & gutter, and base material. Grade existing ground to blend into newly constructed curb ramps and replace topsoil prior to seeding.

It has been estimated to blend topsoil in to the existing ground at a width of 2 feet. Widths may vary at the discretion of the Engineer.

Seed areas disturbed during the removal and construction of ADA Curb Ramps. Seed with the seed mix listed below. Hydraulic mulch after areas have been seeded.

Grass Species	Variety	PLS per Acre
Western Blue Grass	Park	100
Perennial Rye Grass	-----	40
Six-Week Fescue or Dural-hard Fescue	-----	60
Annual Rye Grass	-----	50

Water seed for three weeks minimum after placement in order to provide sufficient moisture for growth as determined by the Engineer. Prevent run-off and puddling. Water trucks will not be driven over turf areas.

Include all costs to remove and replace earth, topsoil, seed, mulch, and water in the contract unit price for "LANDSCAPE PREPARATION".



ESTIMATE OF QUANTITIES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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SPEC CODE	ITEM DESCRIPTION	UNIT	MAINLINE	TOTAL
103	0100 CONTRACT BOND	L SUM	1	1
107	0121 RAILWAY PROTECTION INSURANCE - COMPANY A	L SUM	1	1
107	0122 RAILWAY PROTECTION INSURANCE - COMPANY B	L SUM	1	1
107	0123 RAILWAY PROTECTION INSURANCE - COMPANY C	L SUM	1	1
107	0141 RAILROAD COORDINATION - COMPANY A	L SUM	1	1
107	0142 RAILROAD COORDINATION - COMPANY B	L SUM	1	1
107	0143 RAILROAD COORDINATION - COMPANY C	L SUM	1	1
109	1000 E-TICKETING	L SUM	1	1
202	0114 REMOVAL OF CONCRETE PAVEMENT	SY	457	457
202	0130 REMOVAL OF CURB & GUTTER	LF	715	715
202	0132 REMOVAL OF BITUMINOUS SURFACING	SY	212	212
302	0101 SALVAGED BASE COURSE	CY	1,381	1,381
302	0120 AGGREGATE BASE COURSE CL 5	TON	253	253
401	0050 TACK COAT	GAL	10,106	10,106
401	0070 FOG SEAL	GAL	1,787	1,787
411	0105 MILLING PAVEMENT SURFACE	SY	134,693	134,693
430	0143 RAP - SUPERPAVE FAA 43	TON	15,027	15,027
430	0400 HMA INTELLIGENT COMPACTION	L SUM	1	1
430	0425 PAVER MOUNTED THERMAL PROFILER	L SUM	1	1
430	0500 COMMERCIAL GRADE HOT MIX ASPHALT	TON	83	83
430	1000 CORED SAMPLE	EA	83	83
430	2000 PATCHING	TON	1,381	1,381
430	5815 PG 58S-34 ASPHALT CEMENT	TON	789	789
702	0100 MOBILIZATION	L SUM	1	1
704	0100 FLAGGING	MHR	540	540
704	1000 TRAFFIC CONTROL SIGNS	UNIT	2,940	2,940
704	1048 PORTABLE RUMBLE STRIPS	EA	3	3
704	1054 SIDEWALK BARRICADE	EA	18	18
704	1058 PEDESTRIAN WALKWAY	LF	1,200	1,200
704	1067 TUBULAR MARKERS	EA	280	280
704	1080 STACKABLE VERTICAL PANELS	EA	45	45
704	1185 PILOT CAR	HR	180	180
704	2108 TEMPORARY CURB RAMP	EA	18	18

ESTIMATE OF QUANTITIES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	8	2

SPEC CODE	ITEM DESCRIPTION	UNIT	MAINLINE	TOTAL
706	0550 BITUMINOUS LABORATORY	EA	1	1
706	0600 CONTRACTOR'S LABORATORY	EA	1	1
708	1540 INLET PROTECTION-SPECIAL	EA	24	24
709	0100 GEOSYNTHETIC MATERIAL TYPE G	SY	6,209	6,209
722	6200 ADJUST MANHOLE	EA	6	6
748	0100 CURB & GUTTER	LF	715	715
748	1020 VALLEY GUTTER 36IN	SY	33	33
750	0115 SIDEWALK CONCRETE 4IN	SY	455	455
750	2115 DETECTABLE WARNING PANELS	SF	298	298
760	0025 SINUSOIDAL RUMBLE STRIP - ASPHALT SHOULDER	MILE	8.226	8.226
760	0027 SINUSOIDAL RUMBLE STRIP - ASPHALT CENTERLINE	MILE	4.113	4.113
762	0103 PVMT MK PAINTED-MESSAGE	SF	705.5	705.5
762	0432 SHORT TERM 6IN LINE-TYPE NR	LF	48,138	48,138
762	1106 PVMT MK PAINTED 6IN LINE	LF	88,552	88,552
762	1112 PVMT MK PAINTED 12IN LINE	LF	843	843
762	1124 PVMT MK PAINTED 24IN LINE	LF	90	90
970	0008 LANDSCAPE PREPARATION	SY	289	289

BASIS OF ESTIMATE

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	10	1

Design Calculations			
Description	Unit	Width	Quantity
Typical Section 1: 5.687 Miles			
Milling Pavement Surface (30 FT X 5,280 LF/Mi. ÷ 9 SF/SY = 17,600 SY/Mi.)	SY	30'	100,092
RAP - Superpave FAA 43 (5.0000 SF X 5,280 LF/Mi. X 2 Ton/CY ÷ 27 CF/CY = 1,956 Ton/Mi.)	Ton	30'	11,124
PG 58S-34 Asphalt Cement @ 5.2% (1,956 Tons/Mi. X 0.052 = 102 Ton/Mi.)	Ton	30'	581
Tack Coat @ 0.075 Gal/SY (30 FT X 5,280 LF/Mi. ÷ 9 SF/SY X 0.075 Gal/SY = 1,320 Gal/Mi.)	Gal	30'	7,507
Fog Seal @ 0.05 Gal/SY (10 FT X 5,280 LF/Mi. ÷ 9 SF/SY X 0.05 Gal/SY = 294 Gal/Mi.)	Gal	5' LT 5' RT	1,672
Typical Section 4: 0.156 Miles			
Milling Pavement Surface (40 FT X 5,280 LF/Mi. ÷ 9 SF/SY = 23,467 SY/Mi.)	SY	40'	3,661
RAP - Superpave FAA 43 (6.6643 SF X 5,280 LF/Mi. X 2 Ton/CY ÷ 27 CF/CY = 2,607 Ton/Mi.)	Ton	40'	407
PG 58S-34 Asphalt Cement @ 5.2% (2,607 Tons/Mi. X 0.052 = 136 Ton/Mi.)	Ton	40'	22
Tack Coat @ 0.075 Gal/SY (40 FT X 5,280 LF/Mi. ÷ 9 SF/SY X 0.075 Gal/SY = 1,760 Gal/Mi.)	Gal	40'	275
Typical Section 5: 0.438 Miles			
Milling Pavement Surface (45 FT X 5,280 LF/Mi. ÷ 9 SF/SY = 26,400 SY/Mi.)	SY	45'	11,564
RAP - Superpave FAA 43 (7.4966 SF X 5,280 LF/Mi. X 2 Ton/CY ÷ 27 CF/CY = 2,933 Ton/Mi.)	Ton	45'	1,285
PG 58S-34 Asphalt Cement @ 5.2% (2,933 Tons/Mi. X 0.052 = 153 Ton/Mi.)	Ton	45'	68
Tack Coat @ 0.075 Gal/SY (45 FT X 5,280 LF/Mi. ÷ 9 SF/SY X 0.075 Gal/SY = 1,980 Gal/Mi.)	Gal	45'	868
Typical Section 6: 0.143 Miles			
Milling Pavement Surface (57 FT X 5,280 LF/Mi. ÷ 9 SF/SY = 33,440 SY/Mi.)	SY	57'	4,782
RAP - Superpave FAA 43 (9.4968 SF X 5,280 LF/Mi. X 2 Ton/CY ÷ 27 CF/CY = 3,715 Ton/Mi.)	Ton	57'	532
PG 58S-34 Asphalt Cement @ 5.2% (3,715 Tons/Mi. X 0.052 = 194 Ton/Mi.)	Ton	57'	28
Tack Coat @ 0.075 Gal/SY (57 FT X 5,280 LF/Mi. ÷ 9 SF/SY X 0.075 Gal/SY = 2,508 Gal/Mi.)	Gal	57'	359

Additional Design Calculations			
Description	Unit	Basis	Quantity
Approaches			
Milling Pavement Surface	SY	Sec. 20 Sheets 1-2, Sec. 90 Sheets 1-3	4,209
RAP Superpave FAA 43	Ton		470
PG 58S-34 Asphalt Cement @ 5.2%	Ton		26
Tack Coat @ 0.075 Gal/SY	Gal		318
Aggregate Base Course CI 5	Ton		253
Patching			
Patching	Ton	Sec. 20 Sheets 6-7	1,381
Salvaged Base Course	CY		1,381
Geosynthetic Material Type G	SY		6,209
Typical Sections 2 & 3			
Milling Pavement Surface	SY	Sec. 90 Sheets 1-2	10,385
RAP Superpave FAA 43	Ton		1,157
PG 58S-34 Asphalt Cement @ 5.2%	Ton		61
Tack Coat @ 0.075 Gal/SY	Gal		779
Fog Seal @ 0.05 Gal/SY	Gal		115
BNSF Railroad Crossing Profile Repair			
RAP Superpave FAA 43	Ton	Sec. 20 Sheet 4	52
PG 58S-34 Asphalt Cement @ 5.2%	Ton		3

Estimated Available Milled Material Quantities			
Milled Material	Milled Area (SF)	Length (Mi)	Tons (1.875 Ton/CY)
Typical Section 1	5.0000	5.687	10,427
Typical Section 4	6.6643	0.156	382
Typical Section 5	7.4966	0.438	1,204
Typical Section 6	9.4968	0.143	498
Additional Quantities	See Sec. 20 Sheets 1-2, Sec. 90 Sheets 1-3		1,524
Total (Less 10% for losses)			12,632

Estimated Required & Remaining Milled Material Quantities		
	% RAP by Mix Design	
	10% Min	25% Max
Milled Material required for production of RAP - Superpave FAA 43 (15,027 tons RAP-Superpave FAA 43)	1,503	3,757
Milled Material to become Property of the Contractor	11,129	8,875



BASIS OF ESTIMATE

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	10	2

Temporary Pavement Marking		
Location	Basis	Quantity
RP 176.290 to RP 180.403 (4.113 Mi) (3 Applications-Milled & paved surfaces, rumble strips)		
Short Term 6IN Line-Type NR Yellow Skip Line (10' Line, 30' Skip)	1,320 LF/Mi	16,290 LF
RP 175.266 to RP 175.327, RP 175.468 to RP 175.930, RP 176.222 to RP 176.290, & RP 180.403 to RP 182.062 (2.250 Mi) (2 Applications-Milled & paved surfaces)		
Short Term 6IN Line-Type NR Yellow Skip Line (10' Line, 30' Skip)	1,320 LF/Mi	4,618 LF
Short Term 6IN Line-Type NR Yellow Single Barrier	5,280 LF/Mi	3,296 LF
Short Term 6IN Line-Type NR Yellow Double Barrier	10,560 LF/Mi	10,582 LF
Additional Temporary Pavement Marking Quantities		
S Jct Walsh Co 19 & N Jct Walsh Co 19 (2 Applications-Milled & paved surfaces)		
Short Term 6IN Line-Type NR Yellow Double Barrier	Section 120 Sheets 1-2	13,352 LF

Barrier Striping Locations			
From RP to RP		Single Barrier (Mi)	Double Barrier (Mi)
175.266	175.281		0.015
175.296	175.327		0.031
175.468	175.712		0.244
175.722	175.930	0.208	
181.212	181.262	0.050	
181.262	181.415		0.153
181.415	181.469	0.054	
182.004	182.062		0.058
		0.312	0.501

Sinusoidal Rumble Strips - Asphalt Shoulder and Centerline		
Location	Basis	Quantity
RP 176.290 to RP 180.403 (4.113 Mi)		
Sinusoidal Rumble Strips - Asphalt Shoulder	2 Mi/Mi	8.226 Mi
Sinusoidal Rumble Strips - Asphalt Centerline	1 Mi/Mi	4.113 Mi

Permanent Pavement Marking		
Location	Basis	Quantity
RP 175.266 to RP 175.327, RP 175.468 to RP 175.930, RP 176.222 to RP 181.425, & RP 182.004 to RP 182.062 (5.784 Mi)		
Pvmt Mk Painted 6IN Yellow Skip Line (10' Line, 30' Skip)	1,320 LF/Mi	6,974 LF
Pvmt Mk Painted 6IN Yellow Single Barrier Line	5,280 LF/Mi	1,416 LF
Pvmt Mk Painted 6IN Yellow Double Barrier Line	10,560 LF/Mi	5,291 LF
Pvmt Mk Painted 6IN White Edge Line	5,280 LF/Mi	61,080 LF
RP 181.425 to RP 182.004-Minto Municipal (0.579 Mi)		
Pvmt Mk Painted 6IN Yellow Skip Line (10' Line, 30' Skip)	1,320 LF/Mi	765 LF
Pvmt Mk Painted 6IN Yellow Single Barrier Line	5,280 LF/Mi	233 LF

Additional Permanent Pavement Marking Quantities		
Northern Plains Railroad		
Pvmt Mk Painted-Message (RR Crossing) <i>(SB Approach-1 set consisting of a RR cross, 2 R's & 3 bands and NB Approach-1 band)</i>	D-762-1	156.5 SF
BNSF Railroad		
Pvmt Mk Painted-Message (RR Crossing) <i>(2 sets, each set consisting of a RR cross, 2 R's & 3 bands)</i>	D-762-1	265 SF
S Jct Walsh Co 19 & N Jct Walsh Co 19		
Pvmt Mk Painted-Message (White Arrows) <i>6 Right Turn Arrows & 5 Left Turn Arrows</i>	Sec. 120 Sheets 1-2 & D-762-1	176 SF
Pvmt Mk Painted 6IN Yellow Double Barrier Line	Sec. 120 Sheets 1-2	6,676 LF
Pvmt Mk Painted 6IN White Edge Line		5,142 LF
Pvmt Mk Painted 12IN White Channel Line		843 LF
Pvmt Mk Painted 24IN White Line (Stop Bars)		90 LF
Minto Municipal		
Pvmt Mk Painted 6IN White Line (Crosswalks)	Sec. 120 Sheets 3-4 & D-762-1	975 LF
Pvmt Mk Painted-Message (Continental Crosswalk)		108 SF

Total 6IN Pavement Marking		
	White	Yellow
Short Term 6IN Line - Type NR		48,138 LF
Pvmt Mk Painted 6IN Line	67,197 LF	21,355 LF



BASIS OF ESTIMATE

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	10	3

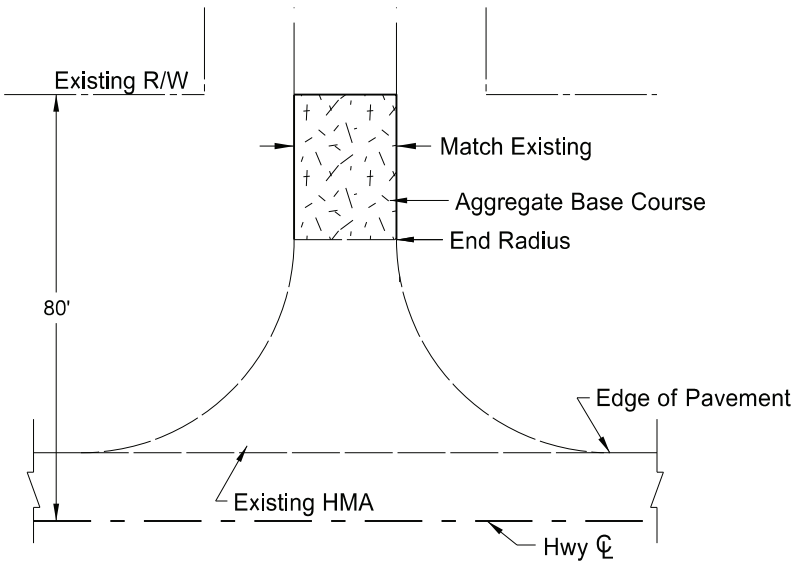
Estimated Flagging Hours			
Operation	Basis	Flagging	Pilot Car
Milling Pavement Surface	5 Days x 12 Hrs/Day x 3 Flaggers 5 Days x 12 Hrs/Day x 1 Pilot Car	180 MHR	60 HR
HMA	6 Days x 12 Hrs/Day x 3 Flaggers 48 additional flagging hours estimated for Junctions/Intersections/Street Returns 6 Days x 12 Hrs/Day x 1 Pilot Car	264 MHR	72 HR
Patching	4 Days x 12 Hrs/Day x 2 Flaggers 4 Days x 12 Hrs/Day x 1 Pilot Car	96 MHR	48 HR
Total Flagging and Pilot Car Hours		540 MHR	180 HR

Adjust Manhole Locations			
RP	Offset	Diameter	Adjacent Surfacing
181.551	LT	26"	Bituminous
181.710	LT	26"	Bituminous
181.750	LT	26"	Bituminous
181.821	RT	24"	Bituminous
181.914	LT	26"	Bituminous
181.957	LT	26"	Bituminous

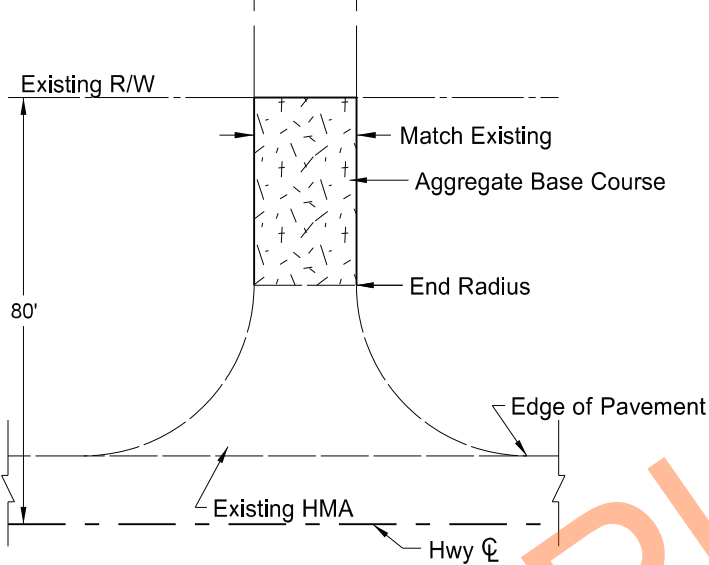
HMA Cored Samples				
Specification	Basis of Estimate	Quantity	Quantity (1 per mile)	Unit
SP 432(25) B.1, "Mat Density"	14,505 Mainline Tons ÷ 900 Ton/Sublot x 2 EA/Lot	34	N/A	EA
430.04 I.2.b(1), "General" (Patching-Section 20 Sheets 6 & 7)	1 Core per 1,000 LF per Lift x 2 Lifts (3,350 LF total)	6	N/A	EA
SSP 4 Longitudinal Joint Density	35,883 LF ÷ 1,000 FT/Sublot x 1 EA/Sublot	36	N/A	EA
430.04 I.2.b(2) "Pavement Thickness Determination Cores"		N/A	7	EA
		76	7	EA



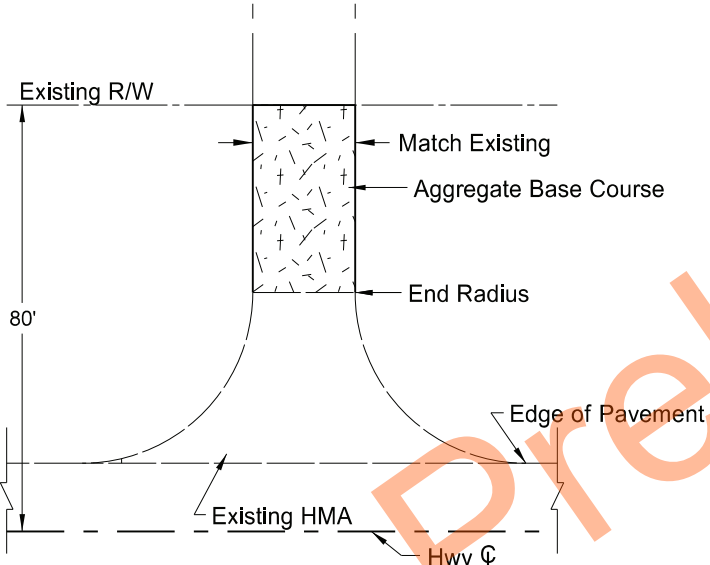
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	20	1



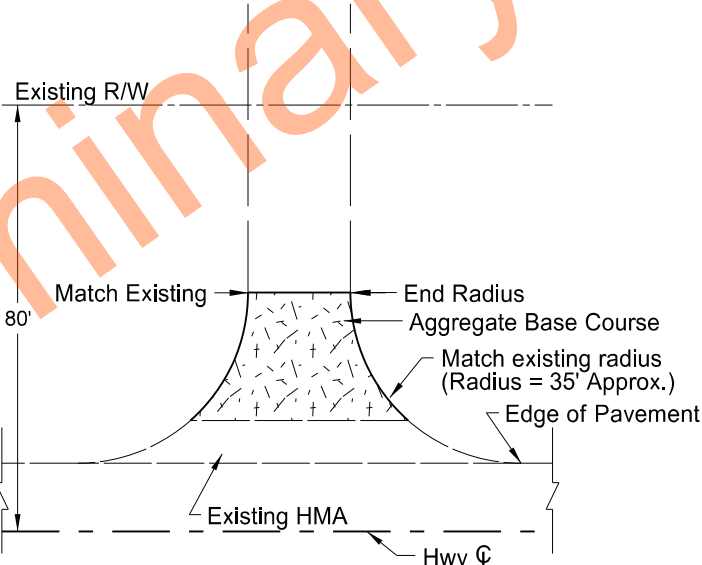
(1) Gravel Section Line or County Road



(2) Gravel Private Drive Approach



(3) Gravel Commercial Drive Approach



(4) Field Drive Approach

Notes:

1. Actual aggregate base course locations may vary in the field, as directed by the Engineer.
2. Quantity totals have been included in the bid items of the "Estimate of Quantities" of the plans.
3. 50 tons Aggregate base course has been provided in the quantities to fill in around the radii, as directed by the Engineer.

Approach Locations		
175.423	Lt	Gravel Section Line
175.490	Rt	Field Drive
175.708	Rt	Field Drive
176.126	Rt	Field Drive
176.498	Lt	Gravel Commercial Drive
176.550	Lt	Gravel Commercial Drive
176.565	Rt	Field Drive
176.650	Lt	Gravel Commercial Drive
177.050	Lt & Rt	Gravel Section Line
177.586	Lt & Rt	Field Drive
178.099	Lt & Rt	Gravel Section Line
178.393	Lt	Gravel Private Drive
178.708	Lt & Rt	Field Drive
179.080	Lt	Gravel Section Line
179.080	Rt	Field Drive
179.185	Lt	Field Drive
179.390	Rt	Gravel Commercial Drive
179.586	Lt	Field Drive
179.761	Rt	Gravel Commercial Drive
179.997	Rt	Gravel Commercial Drive
180.079	Lt & Rt	Gravel Section Line
180.137	Lt	Gravel Private Drive
180.201	Rt	Gravel Commercial Drive
180.323	Lt	Field Drive
180.723	Lt	Gravel Private Drive
180.825	Lt	Gravel Private Drive
180.903	Lt	Gravel Private Drive
181.050	Lt & Rt	Gravel Section Line
181.153	Lt	Gravel Private Drive

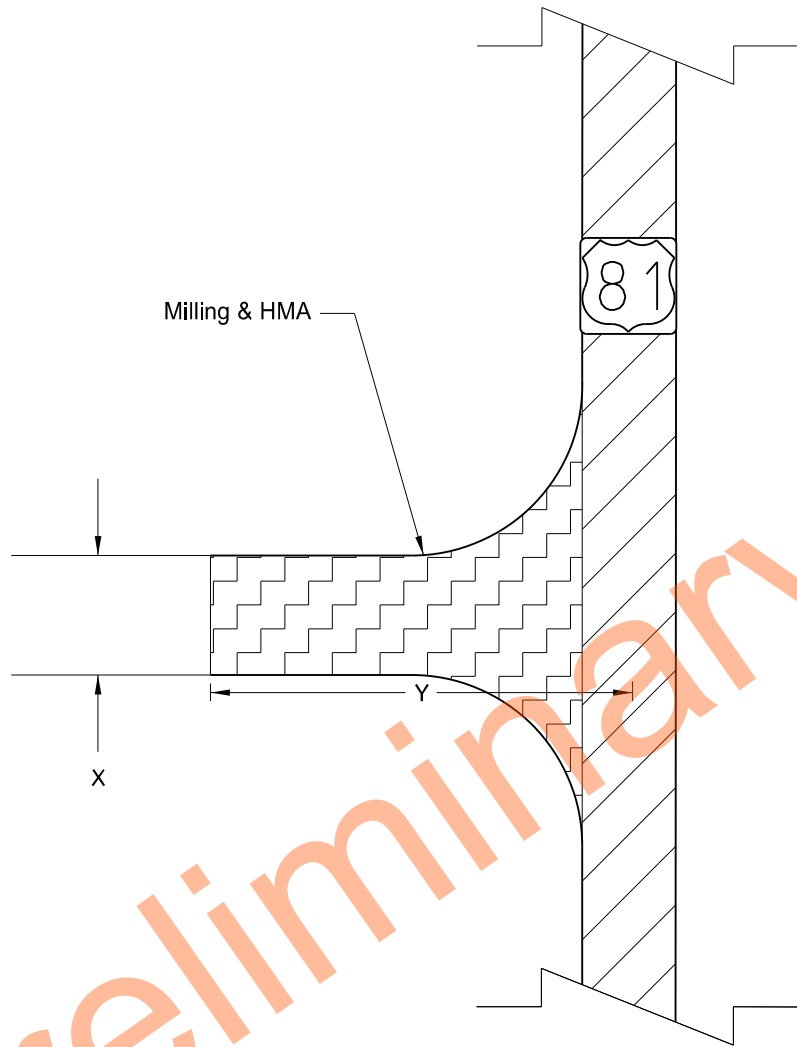
BASIS OF ESTIMATE		(1)	(2)	(3)	(4)	TOTALS
ITEM	UNIT	Gravel Section Line	Gravel Private Drive	Gravel Commercial Drive	Field Drive	
Number of Locations	#	10	6	7	12	35
Aggregate Base Course CL 5	TON	4.8	6.5	7.5	3.8	186

Approach Paving Details - Existing Rural Approaches

Milling & HMA, ADA Curb Ramp Revisions
Ardoch N thru Minto



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	20	2



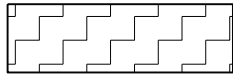
Paved Approaches

	RP	X	Y	Area
Minto City Park	181.406	~28'	45'	124 SY
Lewis Ave	181.476	~33'	47'	111 SY
Duncan Ave	181.545	~21'	47'	82 SY
W Gillespie Ave	181.639	~33'	47'	113 SY
E Gillespie Ave	181.639	~33'	45'	106 SY
W Broughton Ave	181.714	~33'	47'	92 SY
E Broughton Ave	181.714	~33'	47'	90 SY
W Harvey Ave	181.783	~57'	48'	142 SY
E Harvey Ave	181.783	~57'	52'	149 SY
W Wilson Ave	181.852	~33'	48'	103 SY
E Wilson Ave	181.852	~33'	50'	103 SY
W Major Ave*	181.927	~33'	48'	88 SY
E Major Ave	181.927	~33'	48'	114 SY
W Hodson Ave	182.001	~33'	49'	119 SY

*Concrete Valley Gutter

Estimated Additional Quantities

Milling Pavement Surface	1,536 SY
RAP - Superpave FAA 43 @ 2 Tons/CY	171 Ton
PG 58S-34 Asphalt Cement @ 5.2%	9 Ton
Tack Coat @ 0.075 Gal/SY	116 Gal



2" Milling & HMA - Paved Approaches



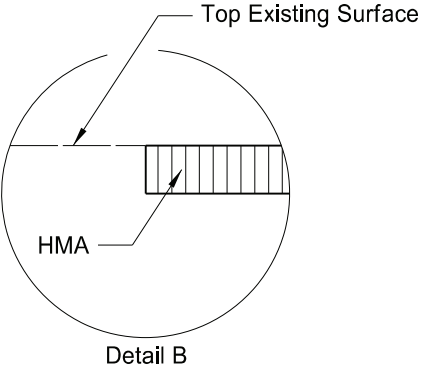
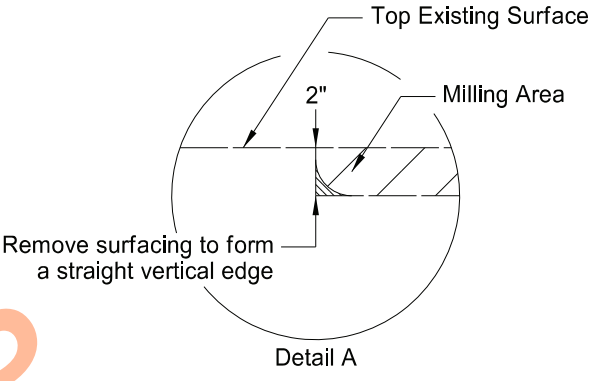
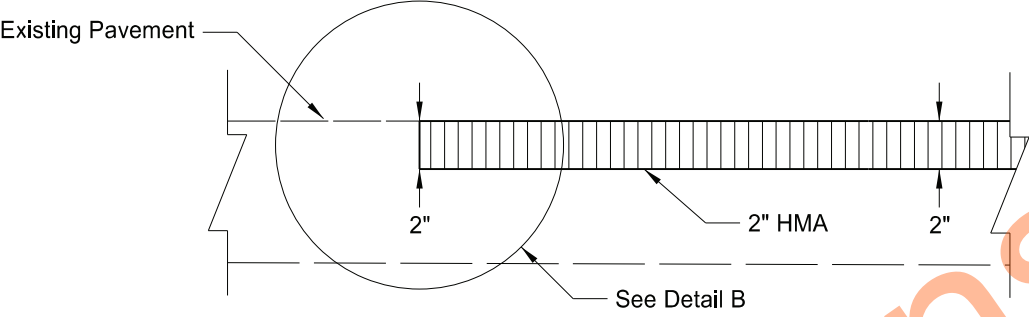
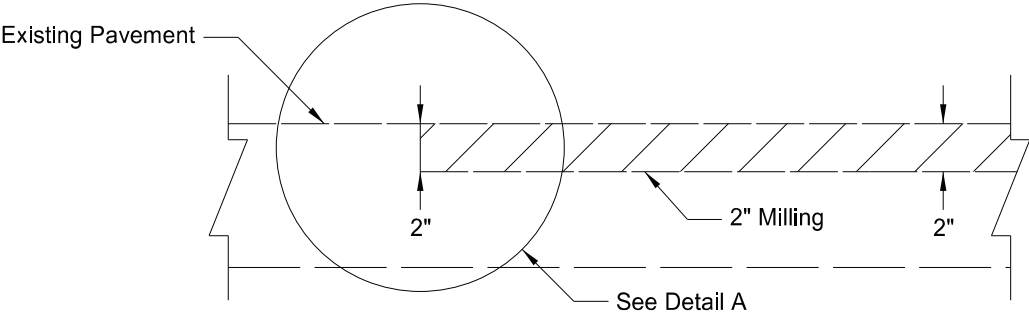
Typical Milling & HMA Surface

Approach Details
Minto City Paved Approaches

Milling & HMA, ADA Curb Ramp Revisions
Ardoch N thru Minto

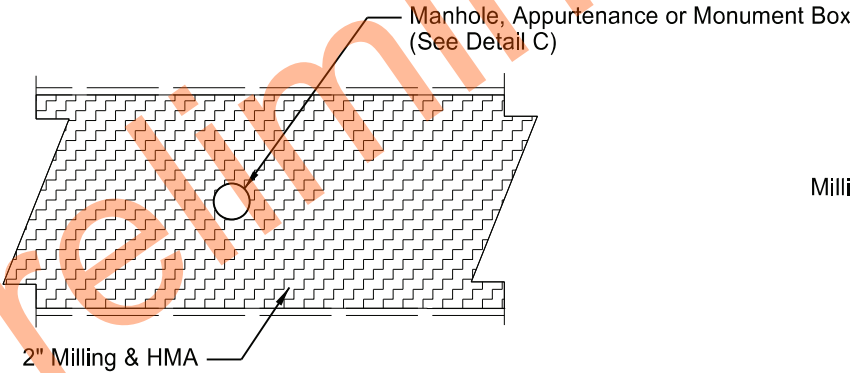


STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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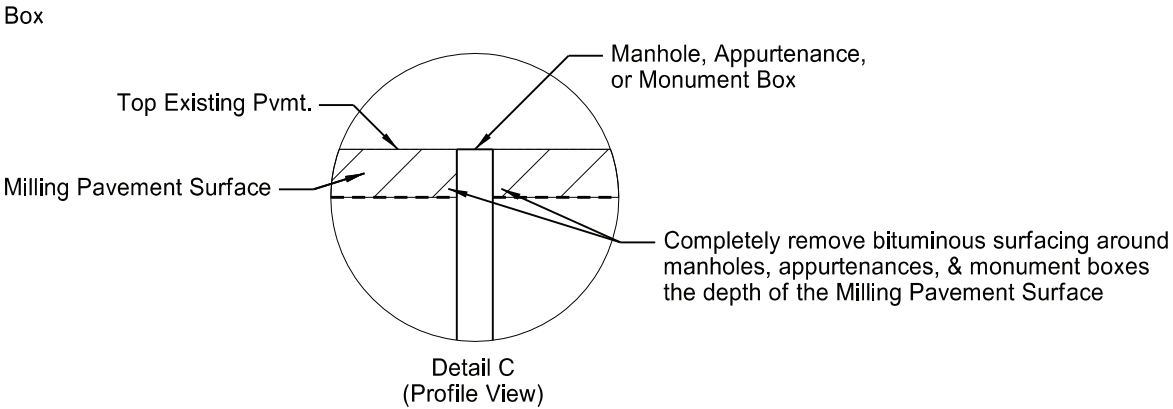


Manhole Locations	
RP	Offset
181.472	LT
181.477	RT
181.485	LT
181.551	LT
181.559	RT
181.568	RT
181.594	LT
181.638	LT
181.642	RT
181.710	LT
181.714	RT
181.750	RT
181.764	LT
181.787	RT
181.821	RT
181.858	RT
181.862	LT
181.914	LT
181.925	RT
181.957	LT
181.995	LT

Milling & HMA Details
Beginning & End of Project
NPR Crossing #696262E - South & North sides of Track 1
NPR Crossing #696262E - South & North sides of Track 2
NPR Crossing #696262E - South & North sides of Track 3
BNSF Crossing #062535U - West & East sides of Track
Structure #0081-181.354 - South & North ends of Bridge deck
Paved Section Lines/City Street Returns



Milling Detail
Refer to note 411-P02



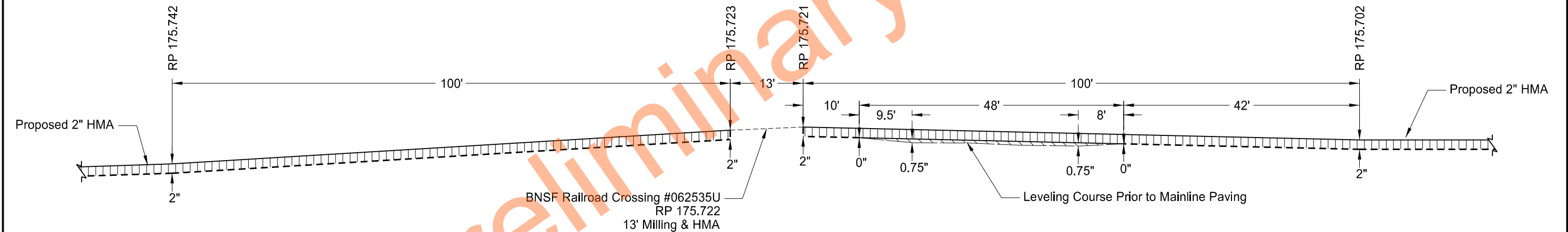
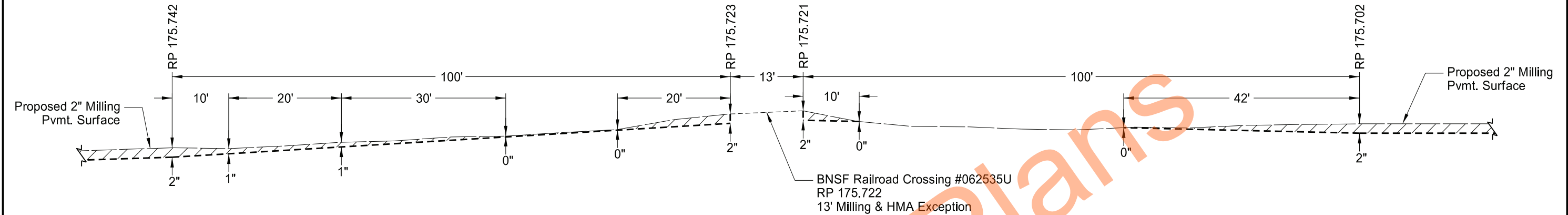
Appurtenance Locations	
RP	Offset
181.479	RT
181.645	LT & RT
181.717	2 on LT
181.717	RT
181.791	LT & RT
181.932	LT & RT

Milling & HMA Details

Milling & HMA, ADA Curb Ramp Revisions
Ardoch N thru Minto



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	20	4



Proposed HMA Profile
BNSF Railroad Crossing #062535U

Additional Quantities for Leveling Course		
RAP - Superpave FAA 43 @ 2 Tons/CY	52 Ton	
PG 58S-34 Asphalt Cement @ 5.2%	3 Ton	

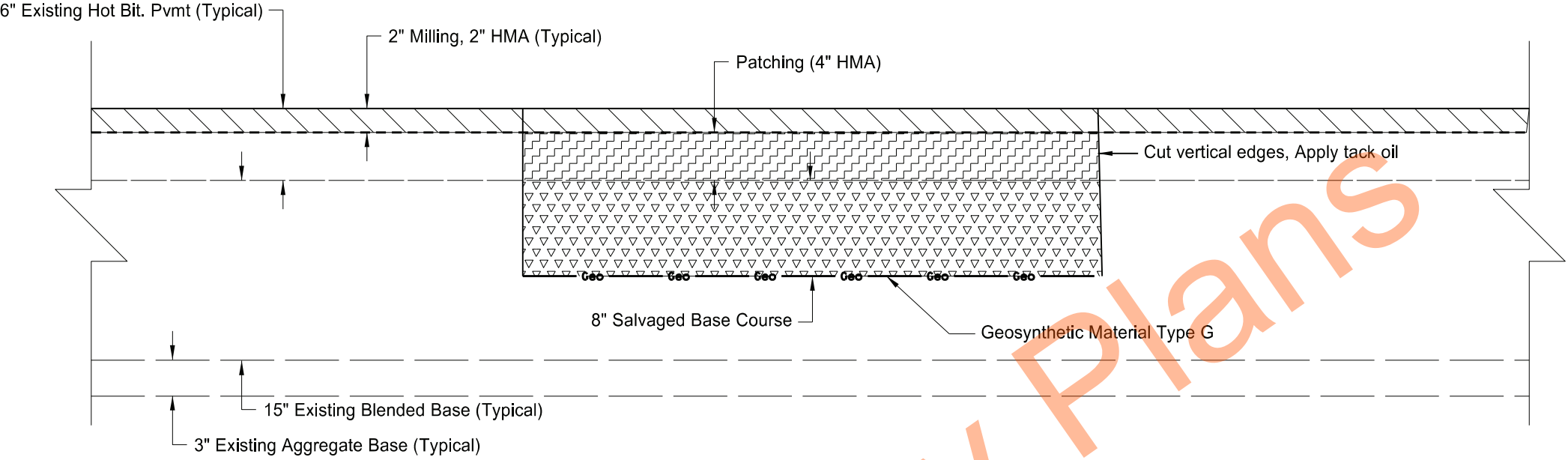
- 2" Milling Pavement Surface
- 2" RAP - Superpave FAA 43
- Leveling Course (RAP - Superpave FAA 43)

Milling & HMA Detail
BNSF Railroad Crossing #062535U
Profile Repair

Milling & HMA, ADA Curb Ramp Revisions
Ardoch N thru Minto

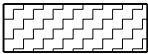


	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	20	5



1. The exact locations, lengths and widths to be patched will be determined by the Engineer in the field.
2. Broken or unstable bituminous surfacing will be removed and replaced according to Section 430.04 G.
3. Remove existing base and subgrade material to the depth required to obtain a stable subgrade. Replace removed base and subgrade material with salvaged base course and compact.
4. The patching must meet specified density. The requirements of Section 430.04 I.2 apply.
5. Include all costs to remove & dispose of unstable material, cut vertical edges, apply tack oil, produce & place HMA in the contract price for PATCHING. Include all costs to haul, place and compact salvaged base course in the contract price for SALVAGED BASE COURSE.

Basis of Estimate							
Location					Patching (Ton)	Salvaged Base Course (CY)	Geosynthetic Material Type G (SY)
Begin RP	End RP	Lane	Length (Ft)	Width (Ft)			
180.817	181.271	SB	2,400	15	889	889	4,000
181.271	181.290	SB & NB	100	30	75	75	334
Totals					964	964	4,334



Patching



Salvaged Base Course



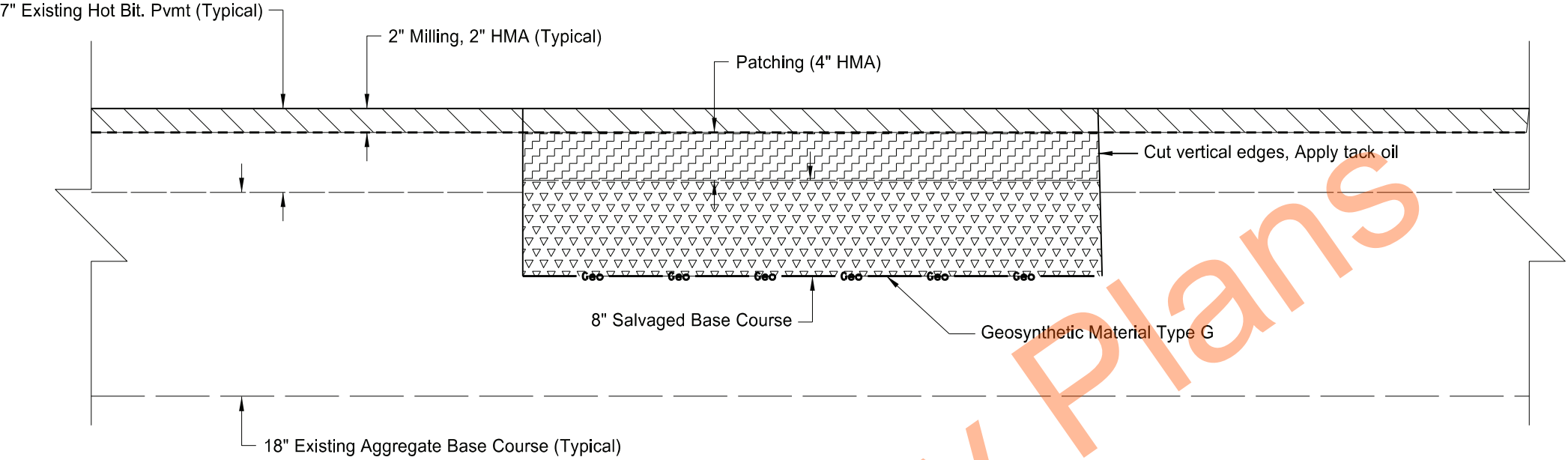
Typical Milling Pavement Surface & HMA

Patching Detail

Milling & HMA, ADA Curb Ramp Revisions
Ardoch N thru Minto

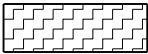


	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	20	6



1. The exact locations, lengths and widths to be patched will be determined by the Engineer in the field.
2. Broken or unstable bituminous surfacing will be removed and replaced according to Section 430.04 G.
3. Remove existing base and subgrade material to the depth required to obtain a stable subgrade. Replace removed base and subgrade material with salvaged base course and compact.
4. The patching must meet specified density. The requirements of Section 430.04 I.2 apply.
5. Include all costs to remove & dispose of unstable material, cut vertical edges, apply tack oil, produce & place HMA in the contract price for PATCHING. Include all costs to haul, place and compact salvaged base course in the contract price for SALVAGED BASE COURSE.

Basis of Estimate							
Location					Patching (Ton)	Salvaged Base Course (CY)	Geosynthetic Material Type G (SY)
Begin RP	End RP	Lane	Length (Ft)	Width (Ft)			
181.428	181.570	SB	750	22.5	417	417	1,875
Totals					417	417	1,875



Patching



Salvaged Base Course



Typical Milling Pavement Surface & HMA

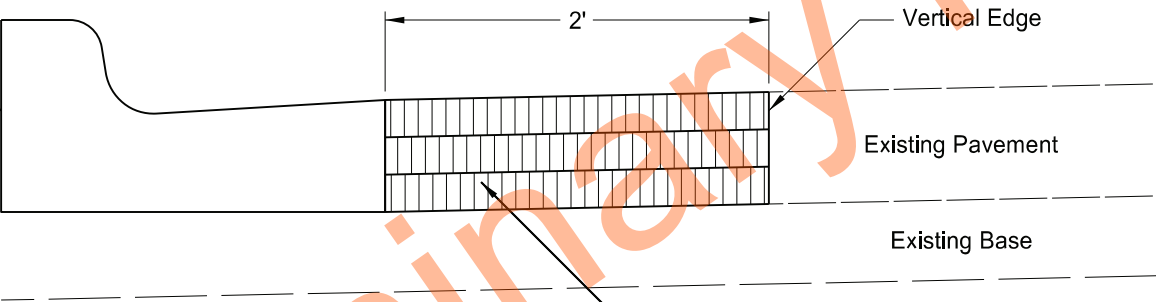
Patching Detail

Milling & HMA, ADA Curb Ramp Revisions
Ardoch N thru Minto



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	20	7

Curb & Gutter replaced for ADA Curb Ramp Revisions



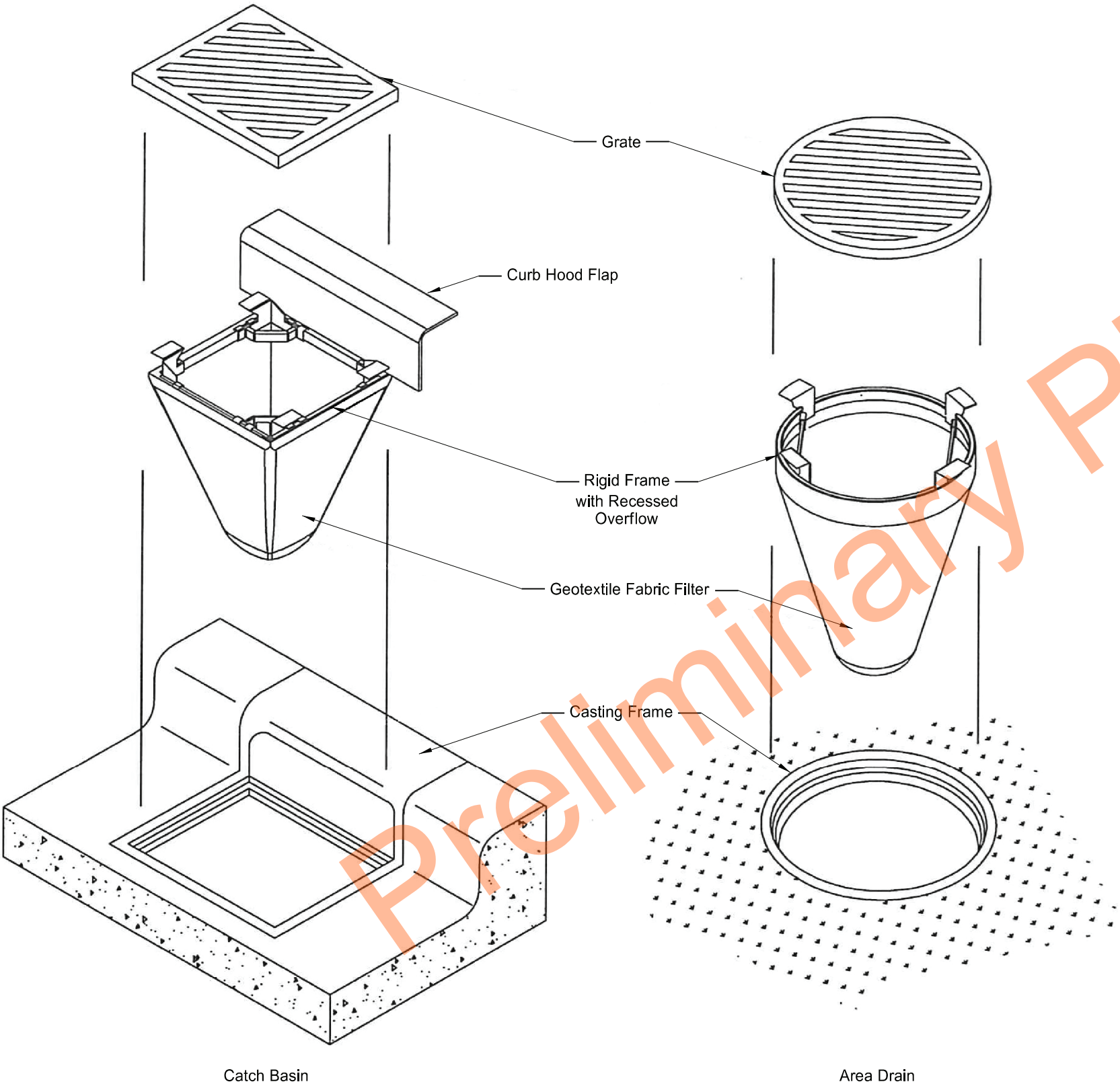
Quantities allow for ~7" Pavement removed to accomodate removal of and forming of ADA Curb Ramp Revision. Replace with Commercial Grade Asphalt.

Pavement Removal & HMA
for ADA Curb Ramp Revision

Milling & HMA, ADA Curb Ramp Revisions
Ardoch N thru Minto



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	20	8



- Notes:
1. Inlet protection device will be manufactured to be recessed within specified or existing casting.
 2. Overflow to be sized at a minimum to accommodate the grate flow capacity.
 3. Furnish, install and maintain (clean) drainage inlet filter assemblies to collect sediment in surface storm water runoff. Dispose of debris or silt tha has accumulated in the bag. Periodic cleaning of the filter is needed as necessary. Remove drainage inlet filter when vegetation has established.
 4. Provide Wimco, Lange IPD, Flexstorm, Dandy Curbsack, or an approved equal.
 5. Keep filter in place until after the gradient surfaces are stabilized and the surrounding street is clean of debris.
 6. Include all costs to furnish, install, maintain, replace, and remove devices in the contract unit price for "INLET PROTECTION - SPECIAL".

Inlet Protection-Special			
RP	Offset	Size	Quantity
181.472	RT	36"	1
181.485	LT & RT	36"	2
181.551	LT & RT	36"	2
181.638	LT & RT	24"	2
181.647	LT & RT	36"	2
181.710	LT & RT	36"	2
181.719	LT & RT	36"	2
181.764	LT & RT	36"	2
181.854	LT & RT	36"	2
181.862	LT & RT	24"	2
181.914	LT & RT	24"	2
181.995	LT & RT	36"	2
182.008	LT	36"	1
Total			24

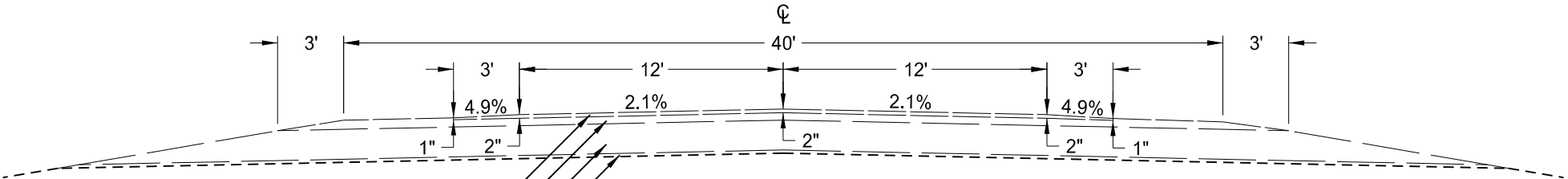
Inlet Protection Device

Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

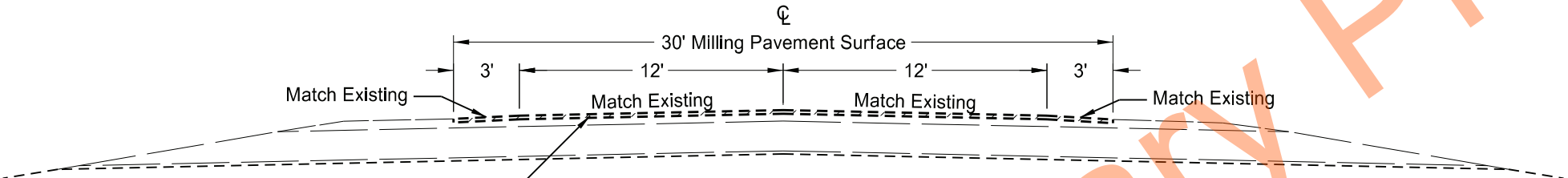
REGISTERED PROFESSIONAL ENGINEER
DUSTIN LANG
PE-6394
DATE 04/28/26
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	30	1



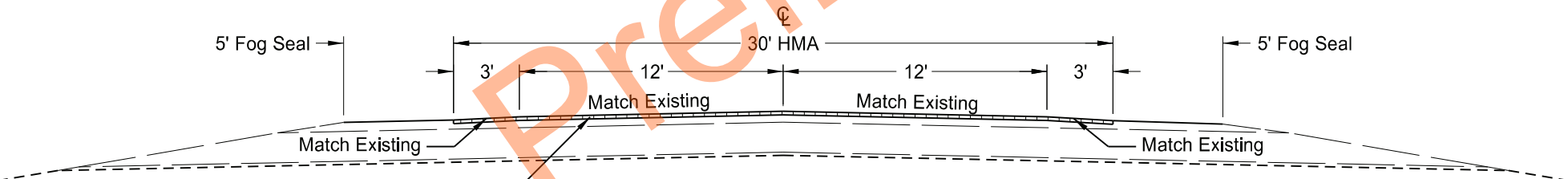
Typical Existing Section 1
RP 175.266 to RP 175.327
RP 175.468 to RP 175.944
RP 176.234 to RP 181.290

2" Recycled HBP Overlay - Superpave FAA 45
4" Hot Bit. Pvmnt. - Cl. 29
15" Blended Base
3" Aggregate Base



Typical Milling Section 1
RP 175.266 to RP 175.327
RP 175.468 to RP 175.944
RP 176.234 to RP 181.290

2" Milling Pavement Surface
Area = 5,000 SF



Typical Proposed Section 1
RP 175.266 to RP 175.327
RP 175.468 to RP 175.944
RP 176.234 to RP 181.290

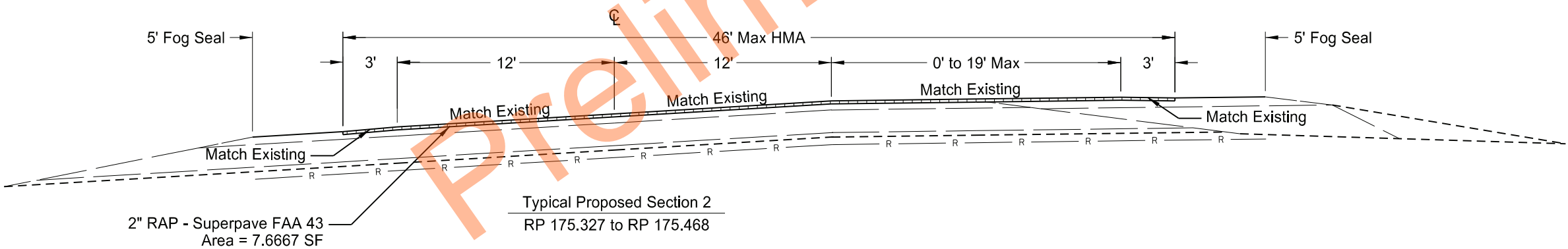
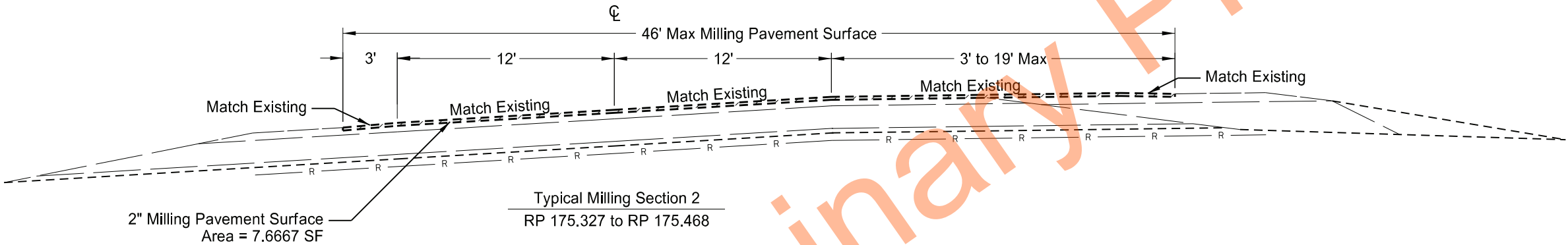
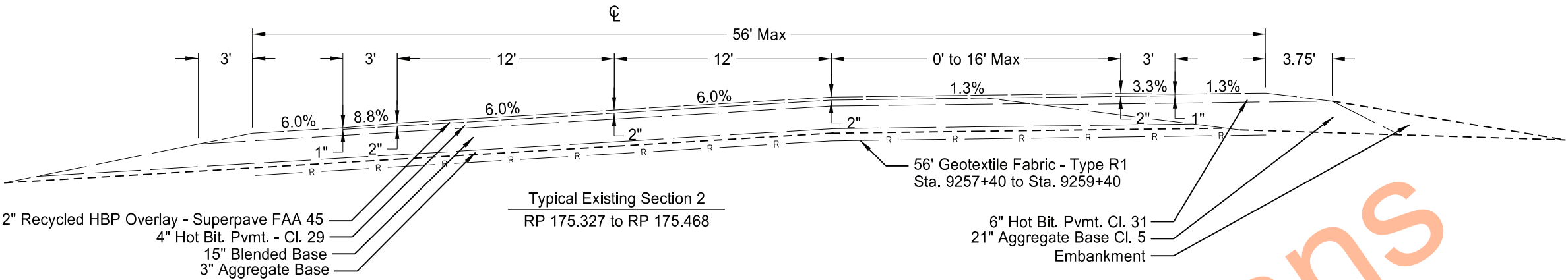
2" RAP - Superpave FAA 43
Area = 5,000 SF

Typical Sections

Milling & HMA, ADA Curb Ramp Revisions
Ardoch N thru Minto



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	30	2

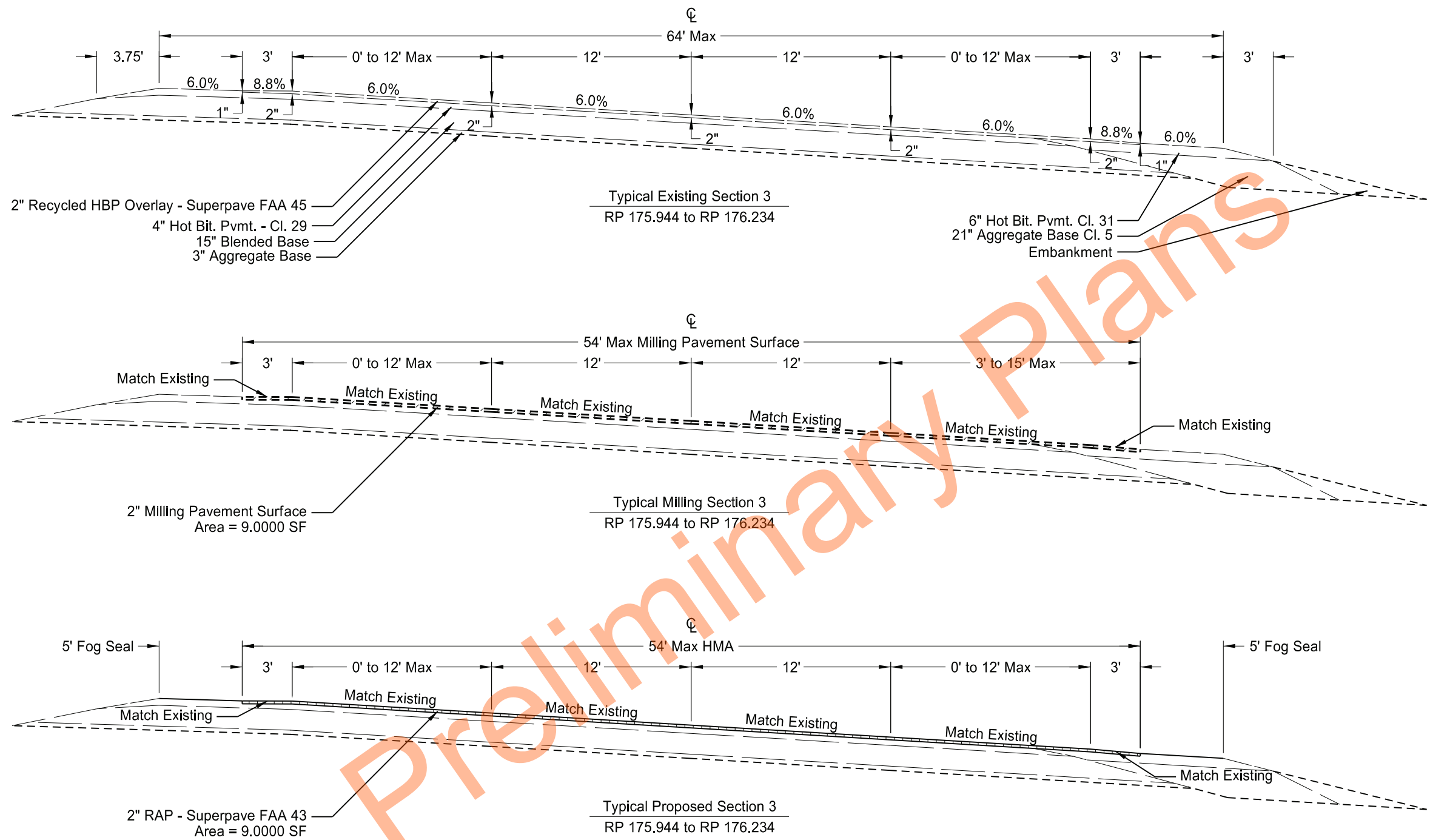


Typical Sections

Milling & HMA, ADA Curb Ramp Revisions
Ardoch N thru Minto



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	30	3

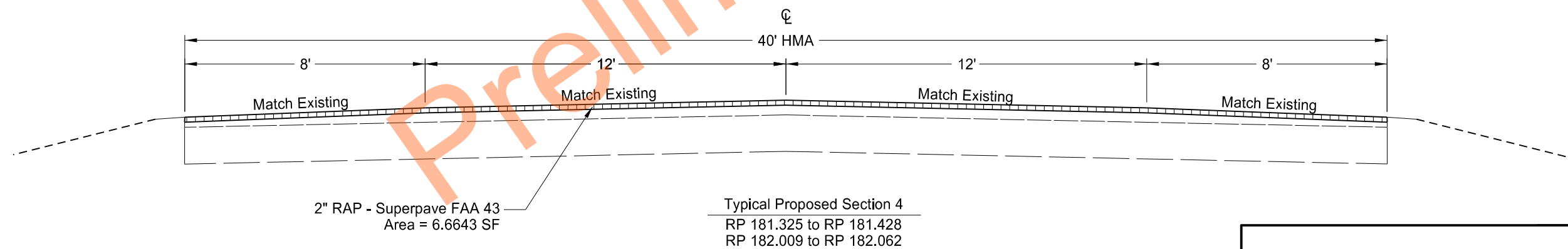
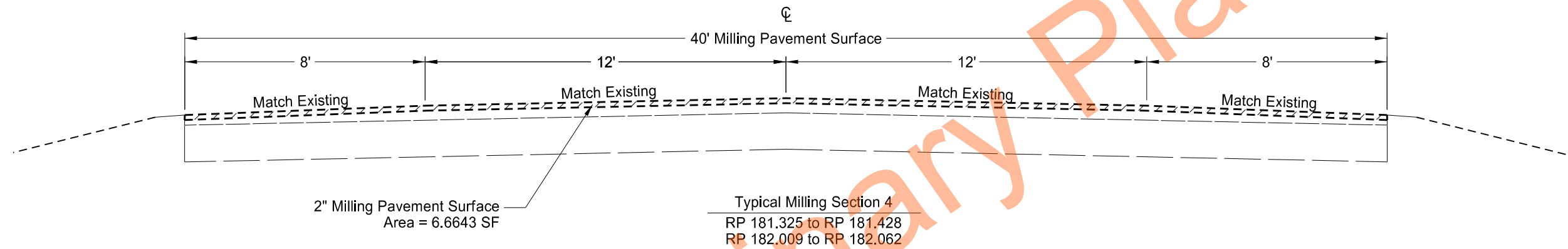
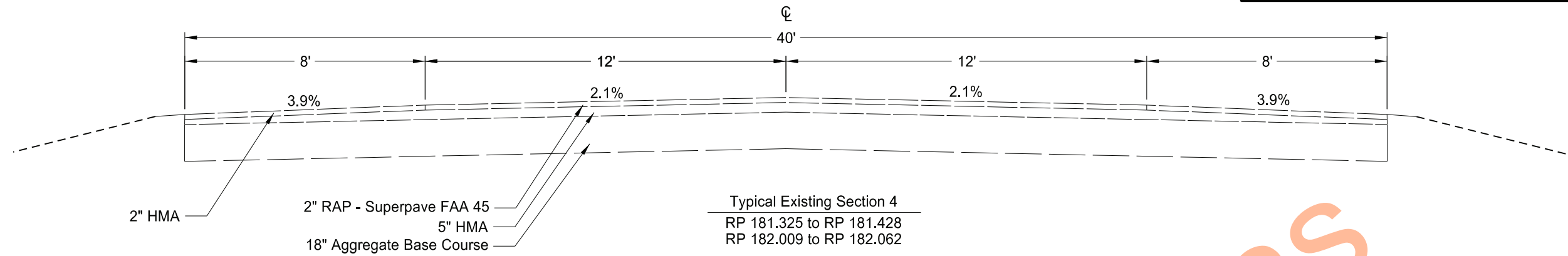


Typical Sections

Milling & HMA, ADA Curb Ramp Revisions
Ardoch N thru Minto



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	30	4



Typical Sections

Milling & HMA, ADA Curb Ramp Revisions
Ardoch N thru Minto

REGISTERED PROFESSIONAL ENGINEER

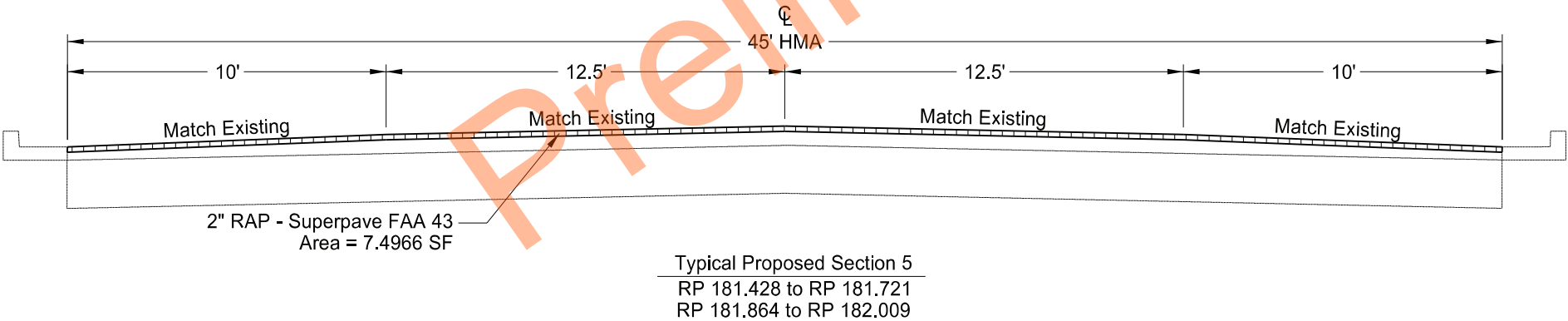
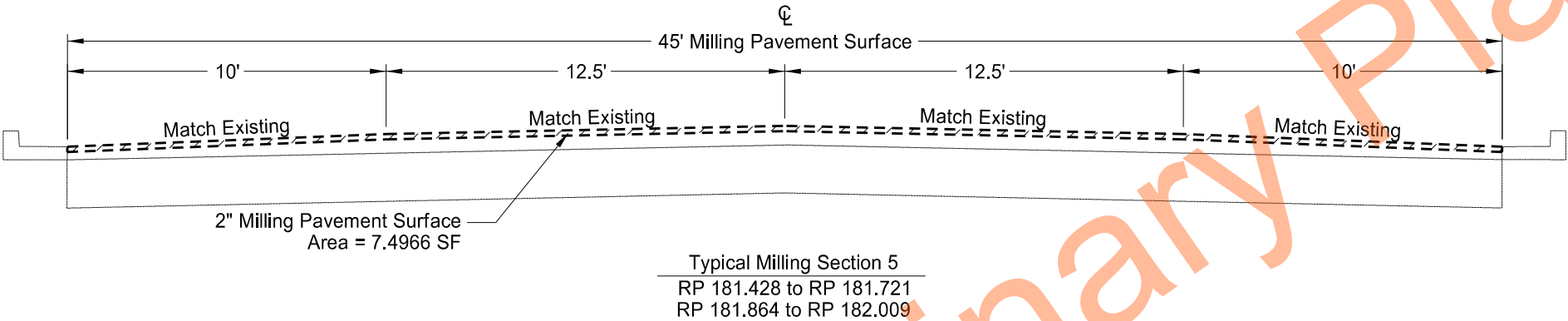
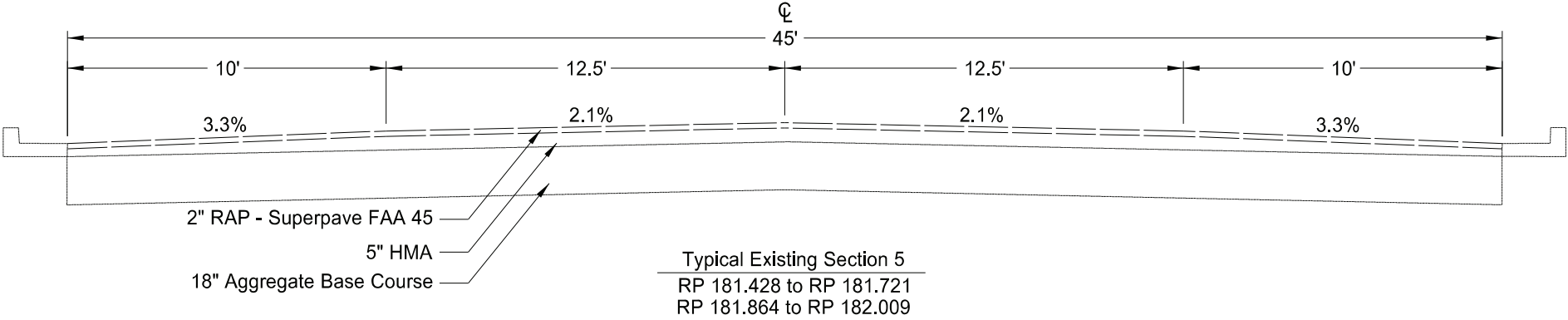
DUSTIN LANG

PE-6394

DATE 04/28/26

NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	30	5

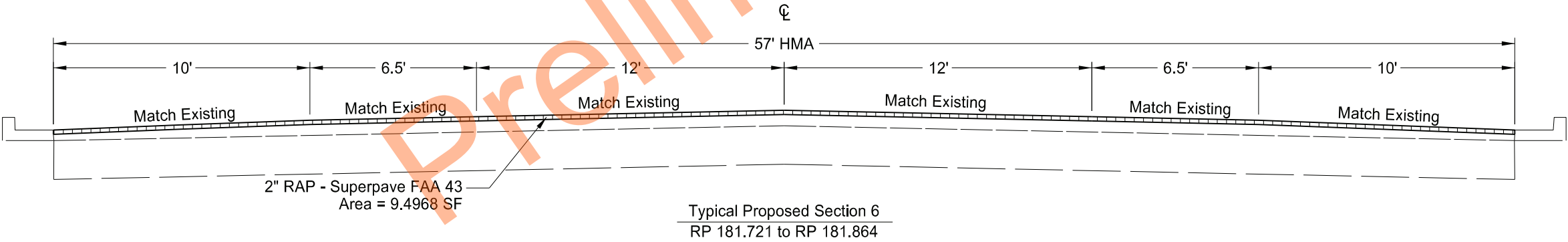
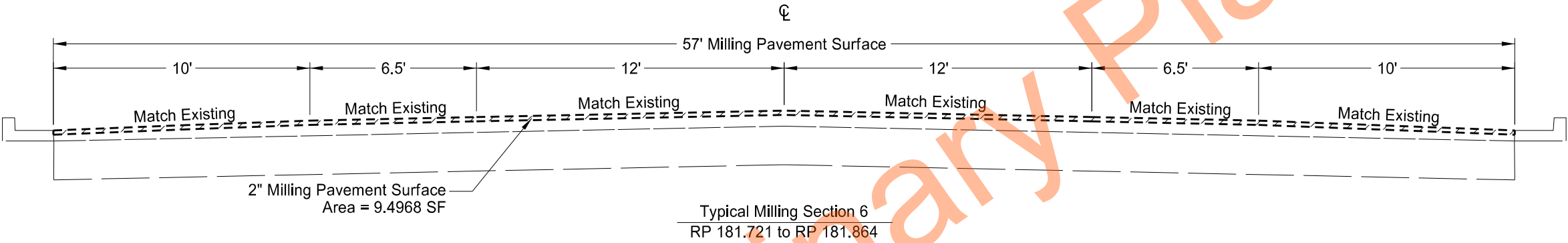
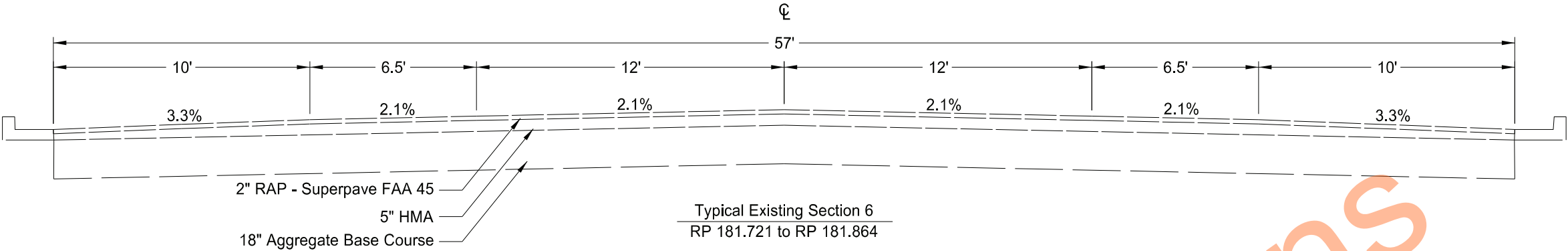


Typical Sections

Milling & HMA, ADA Curb Ramp Revisions
Ardoch N thru Minto



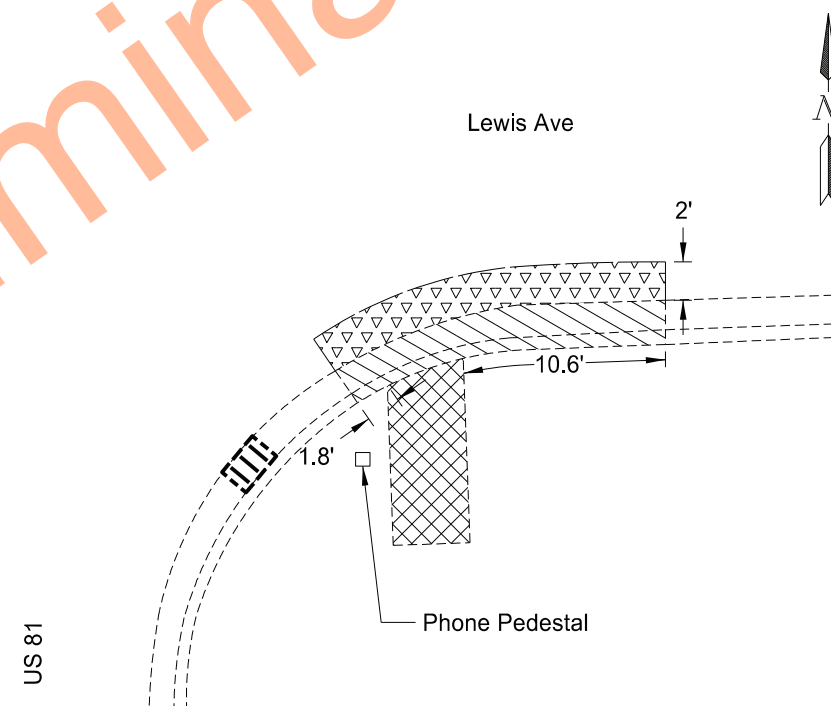
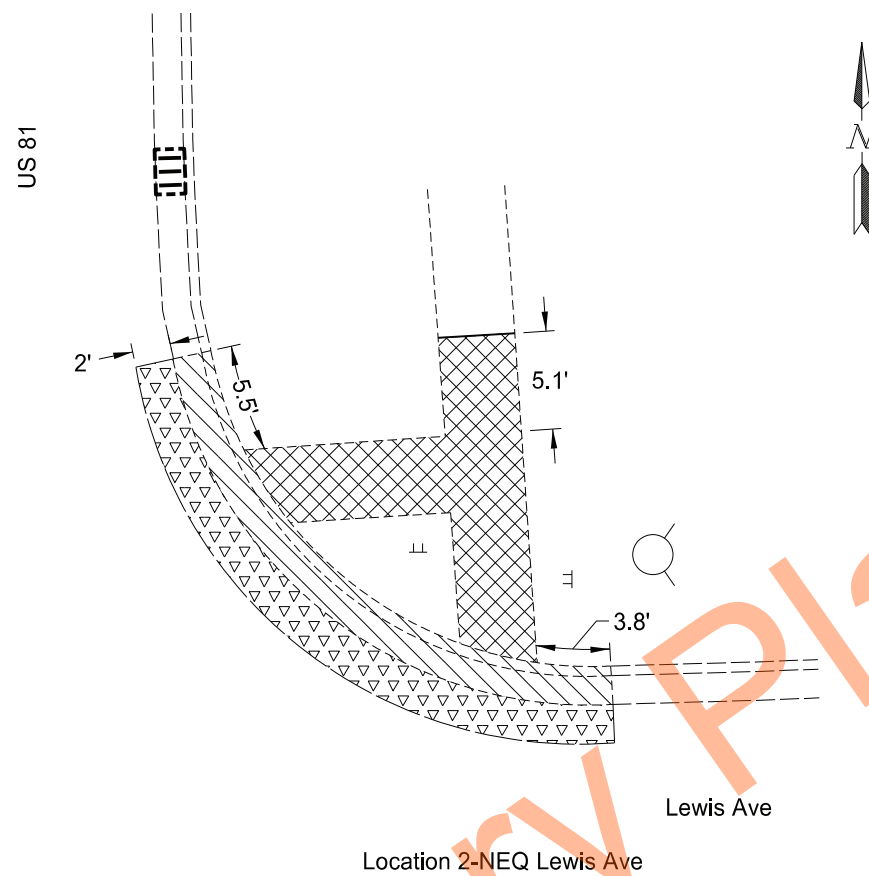
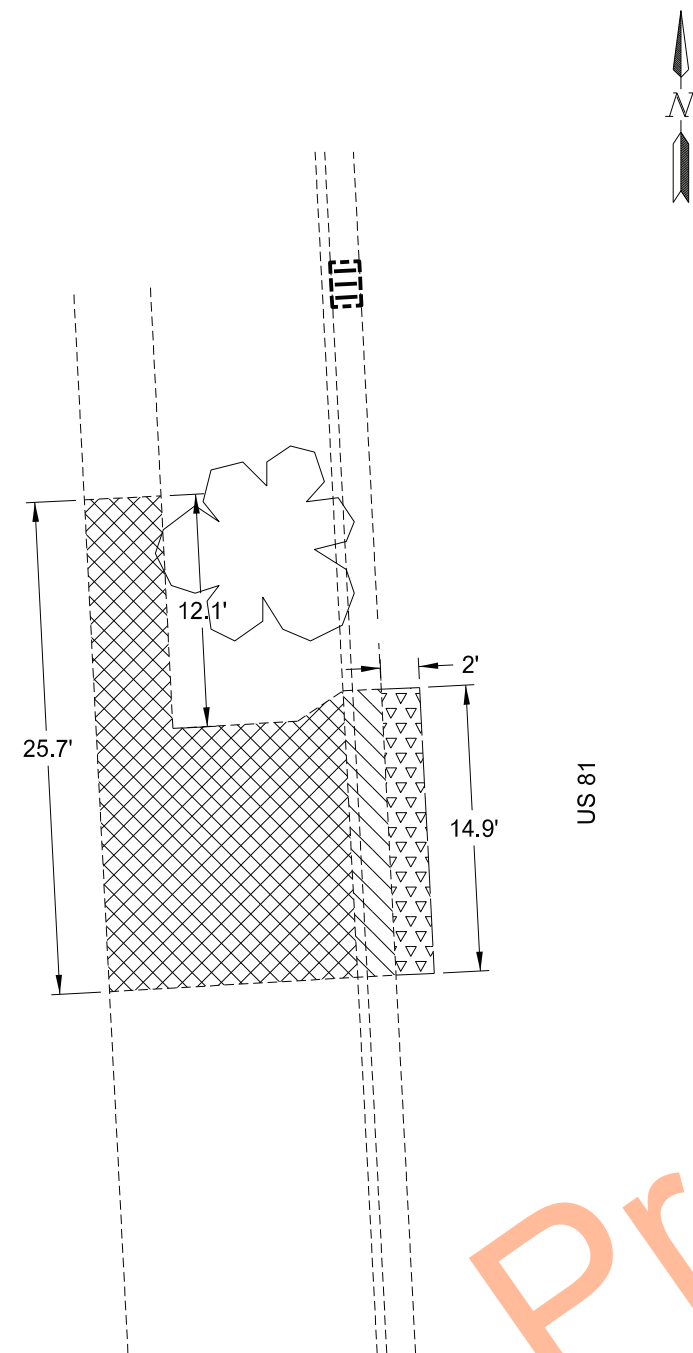
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	30	6



Typical Sections

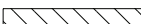
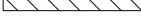
Milling & HMA, ADA Curb Ramp Revisions
Ardoch N thru Minto





STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	40	1

202	0114	Removal of Concrete Pavement	
Location 1			25.0 SY
Location 2			11.5 SY
Location 3			4.0 SY
202	0130	Removal of Curb & Gutter	
Location 1			14.9 LF
Location 2			28.9 LF
Location 3			16.6 LF
202	0132	Removal of Bituminous Surfacing	
Location 1			3.3 SY
Location 2			7.9 SY
Location 3			4.2 SY

	Removal of Concrete Pavement
	Removal of Curb & Gutter
	Removal of Bituminous Surfacing
	Stormwater Inlet

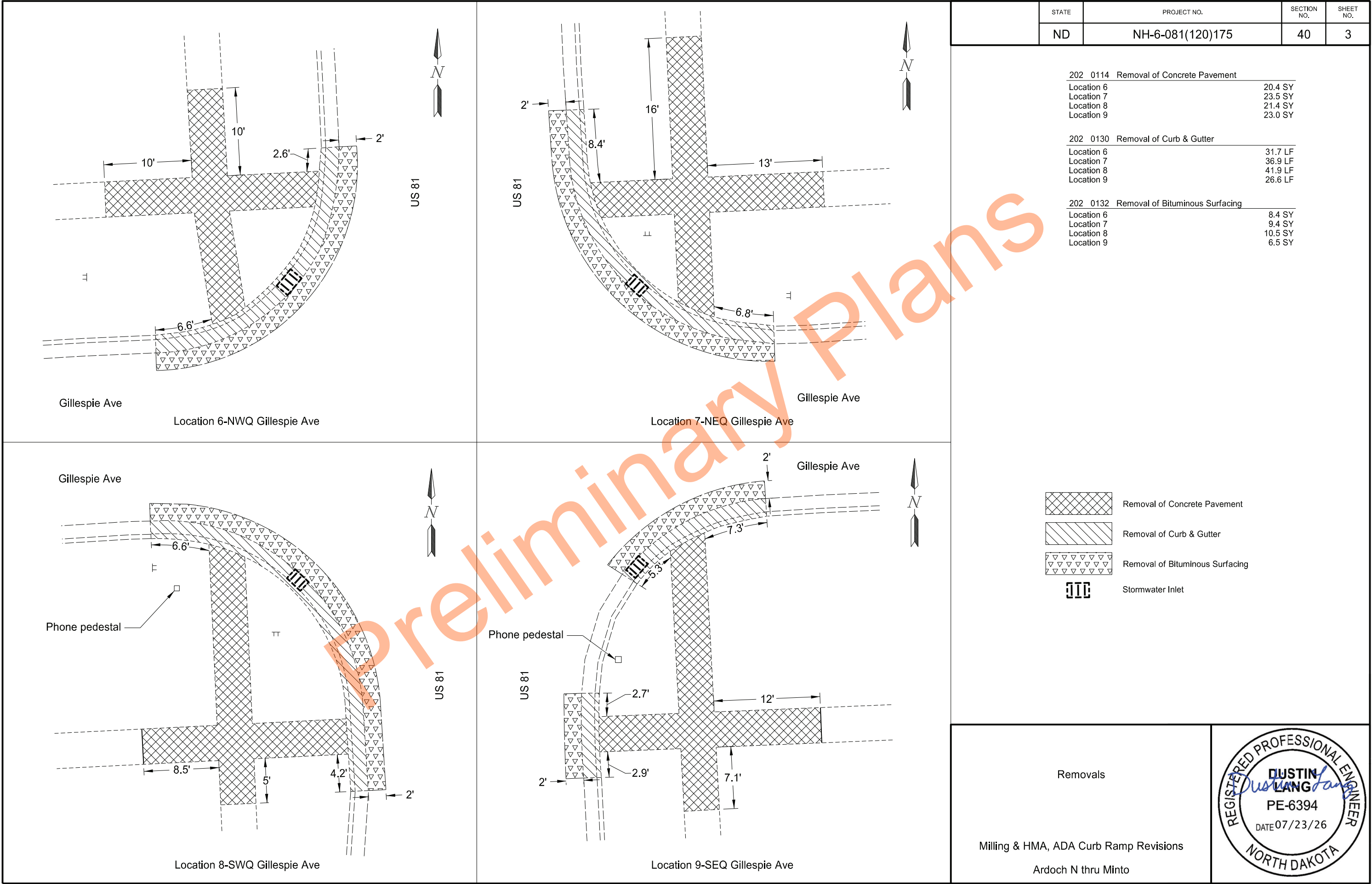
Location 1-NWQ & SWQ Lewis Ave

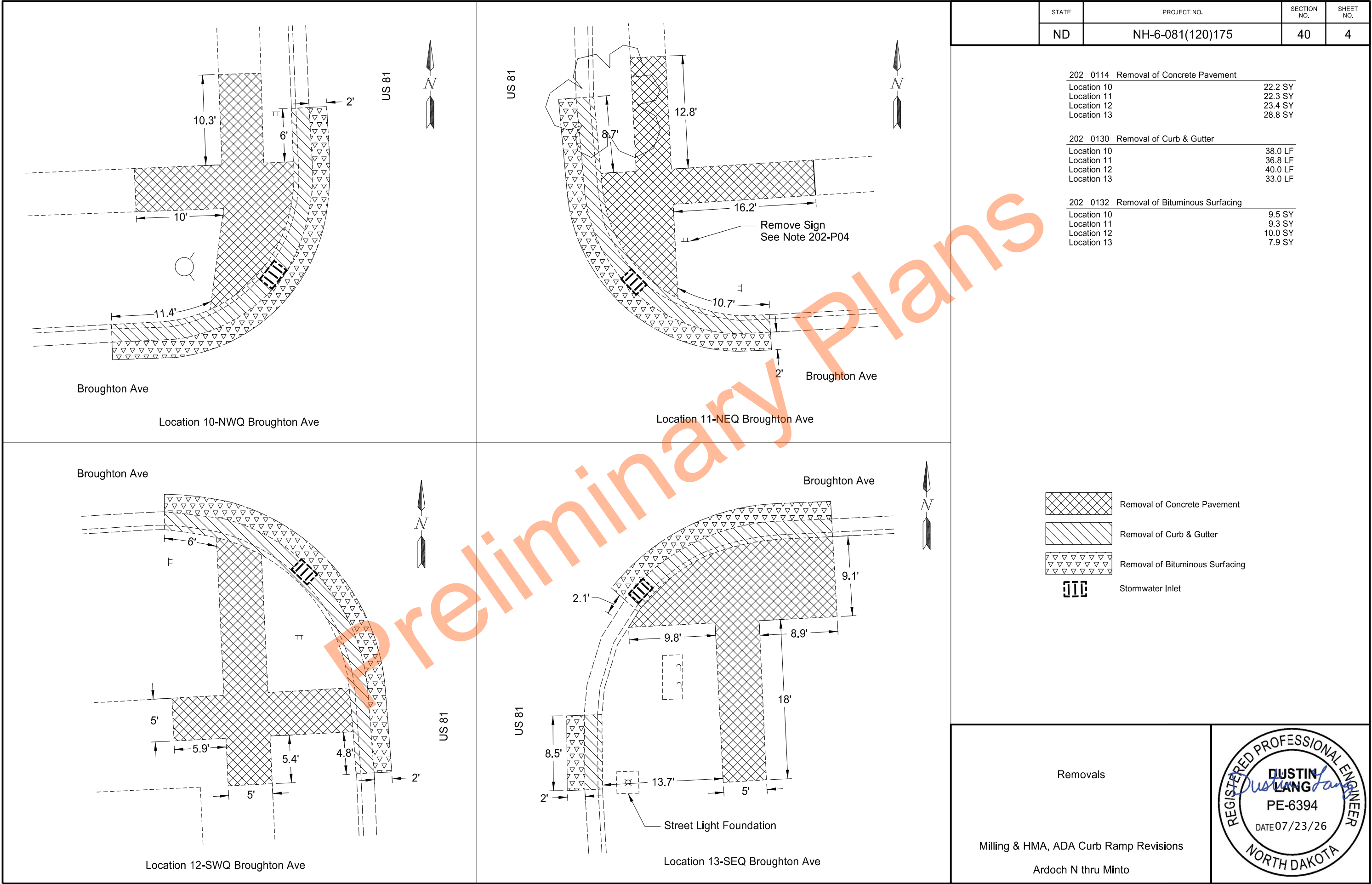
Location 3-SEQ Lewis Ave

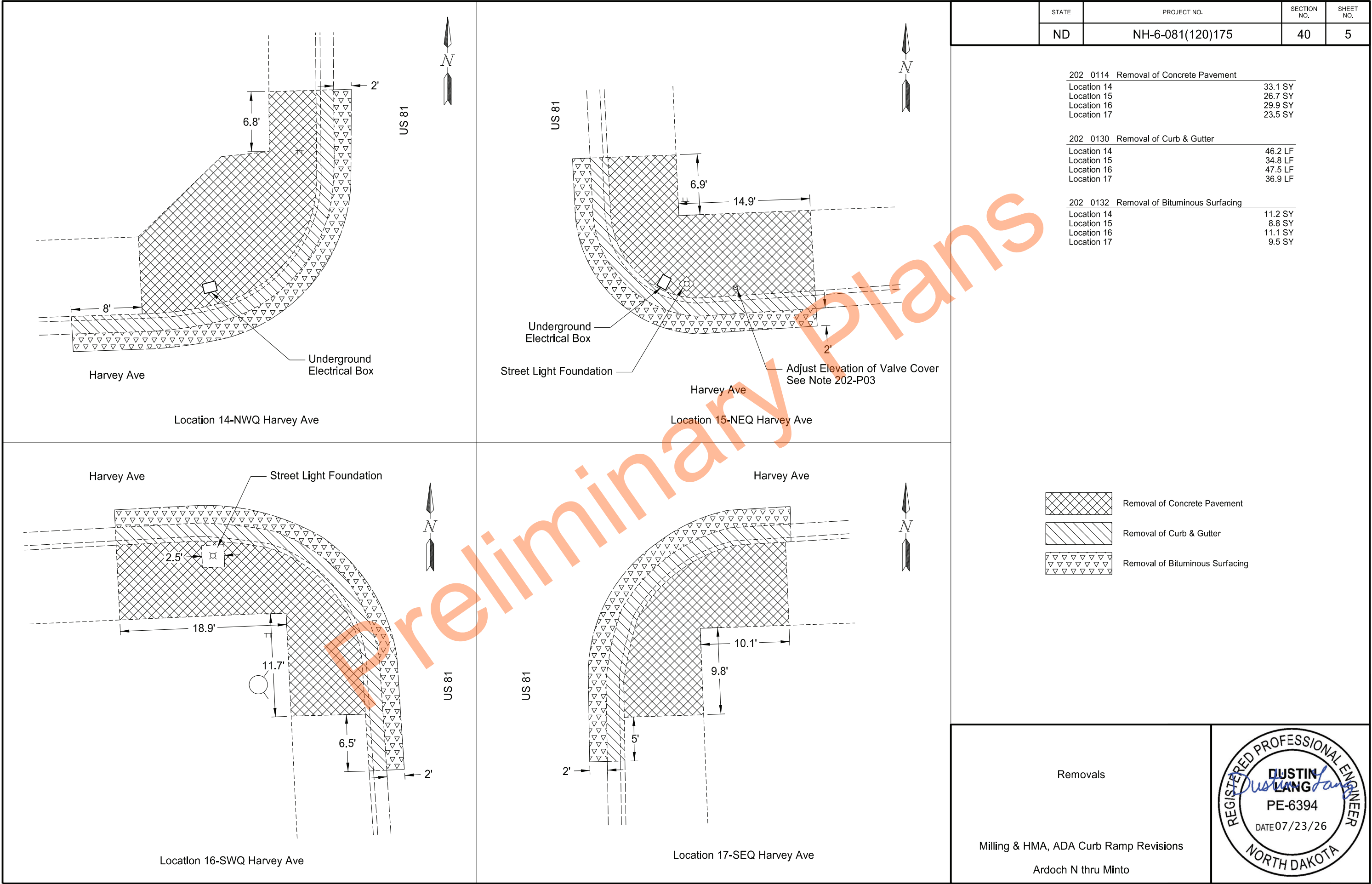
Removals

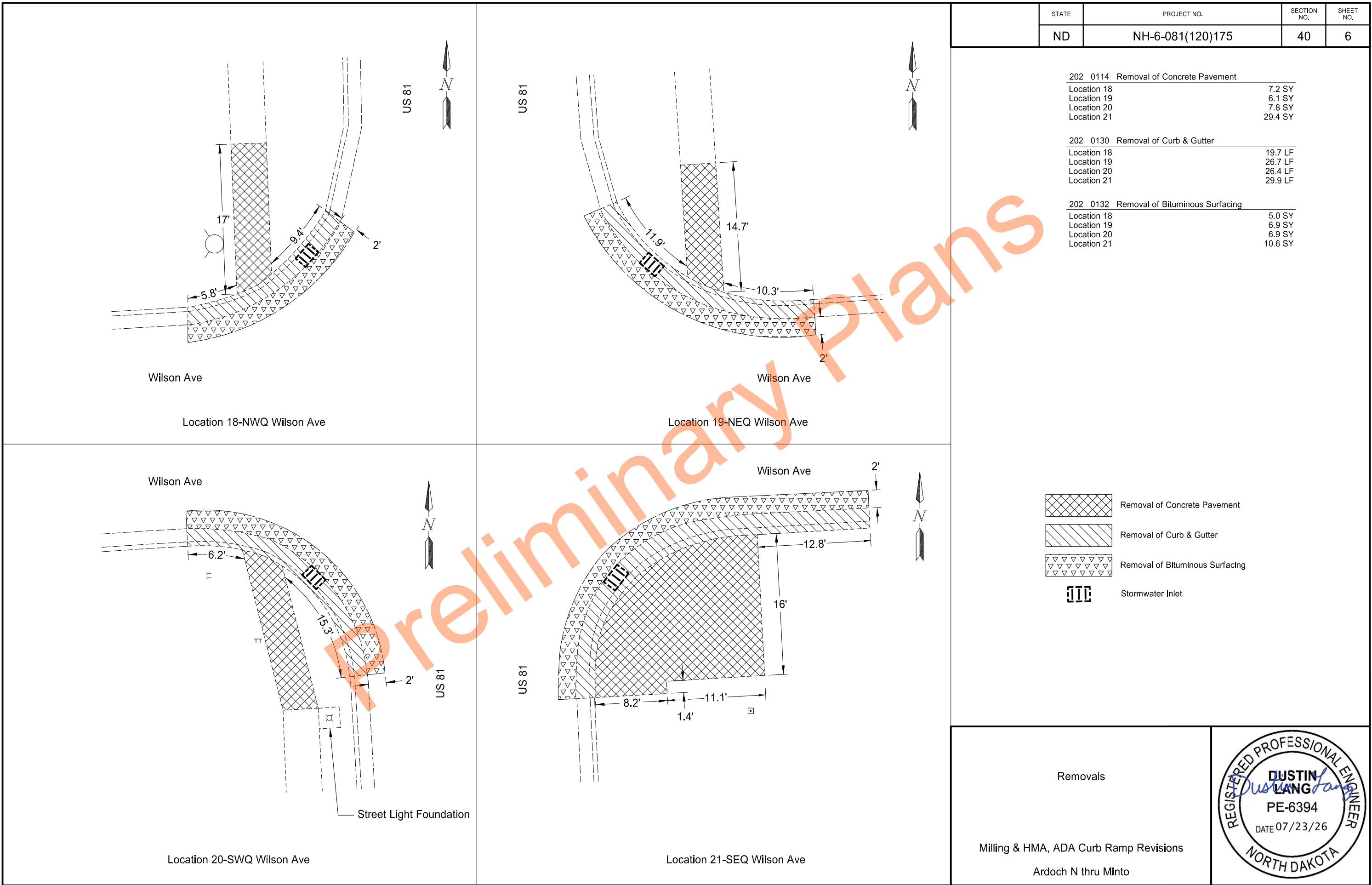
Milling & HMA, ADA Curb Ramp Revisions
Ardoch N thru Minto

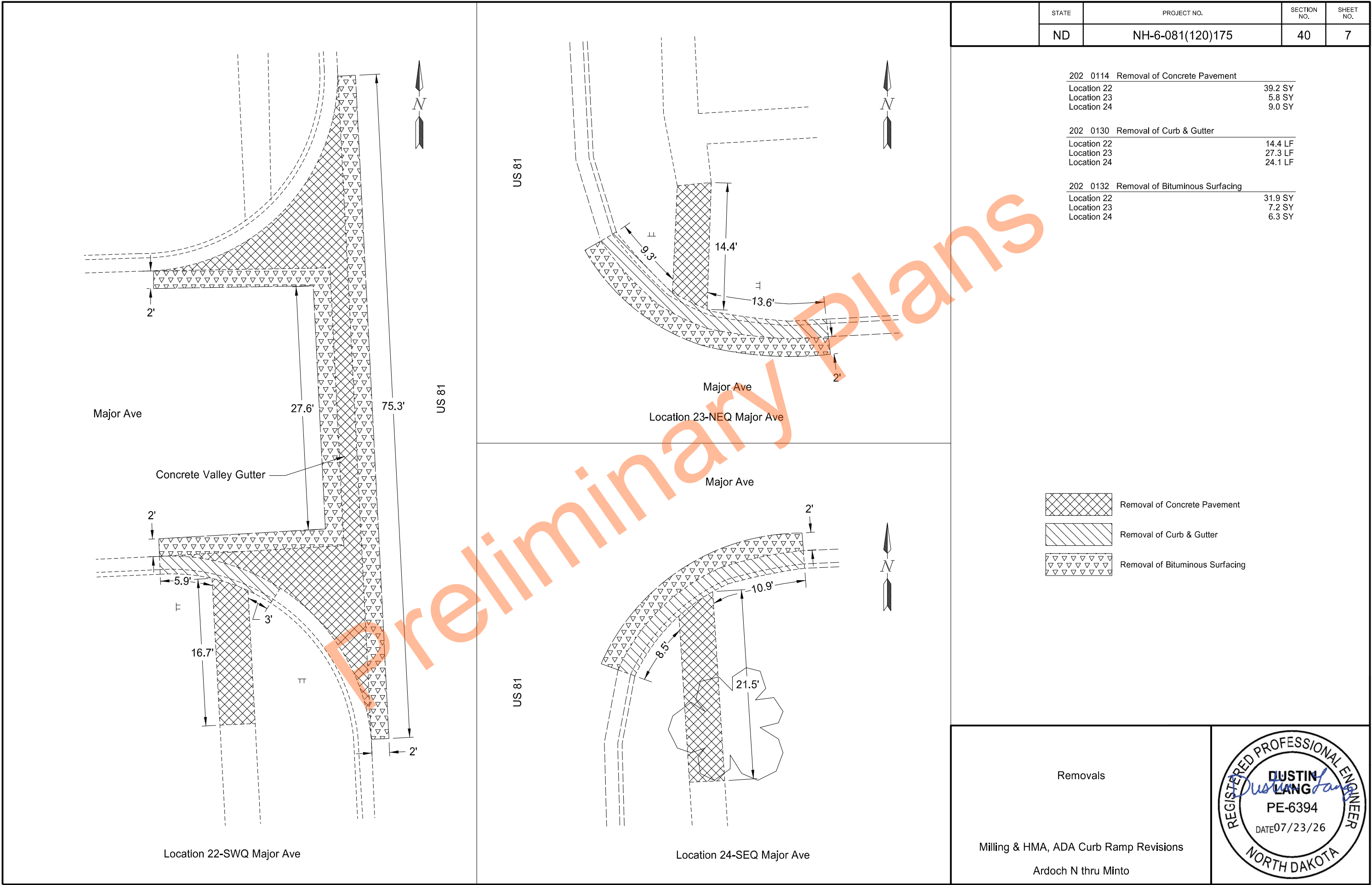


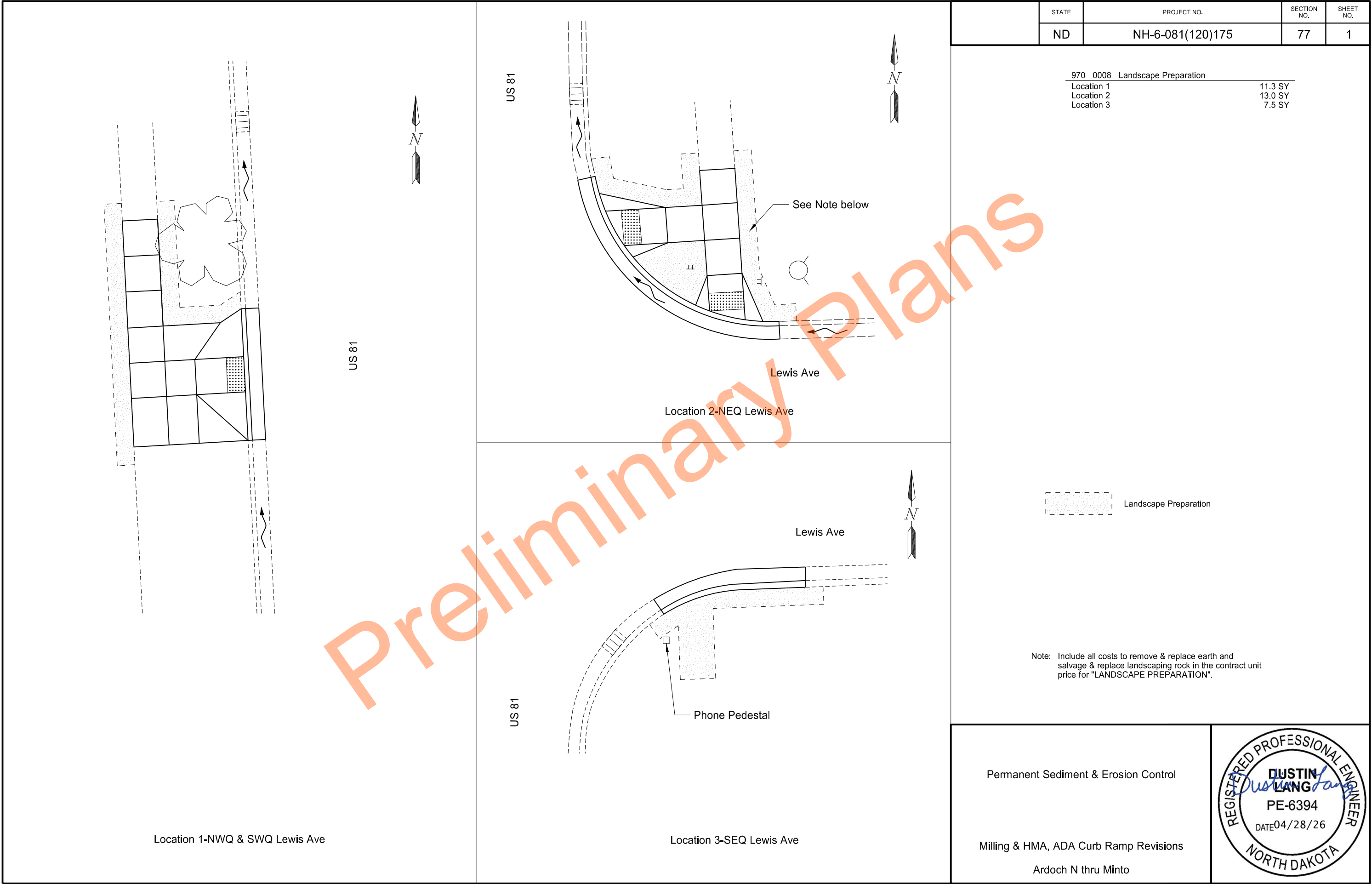


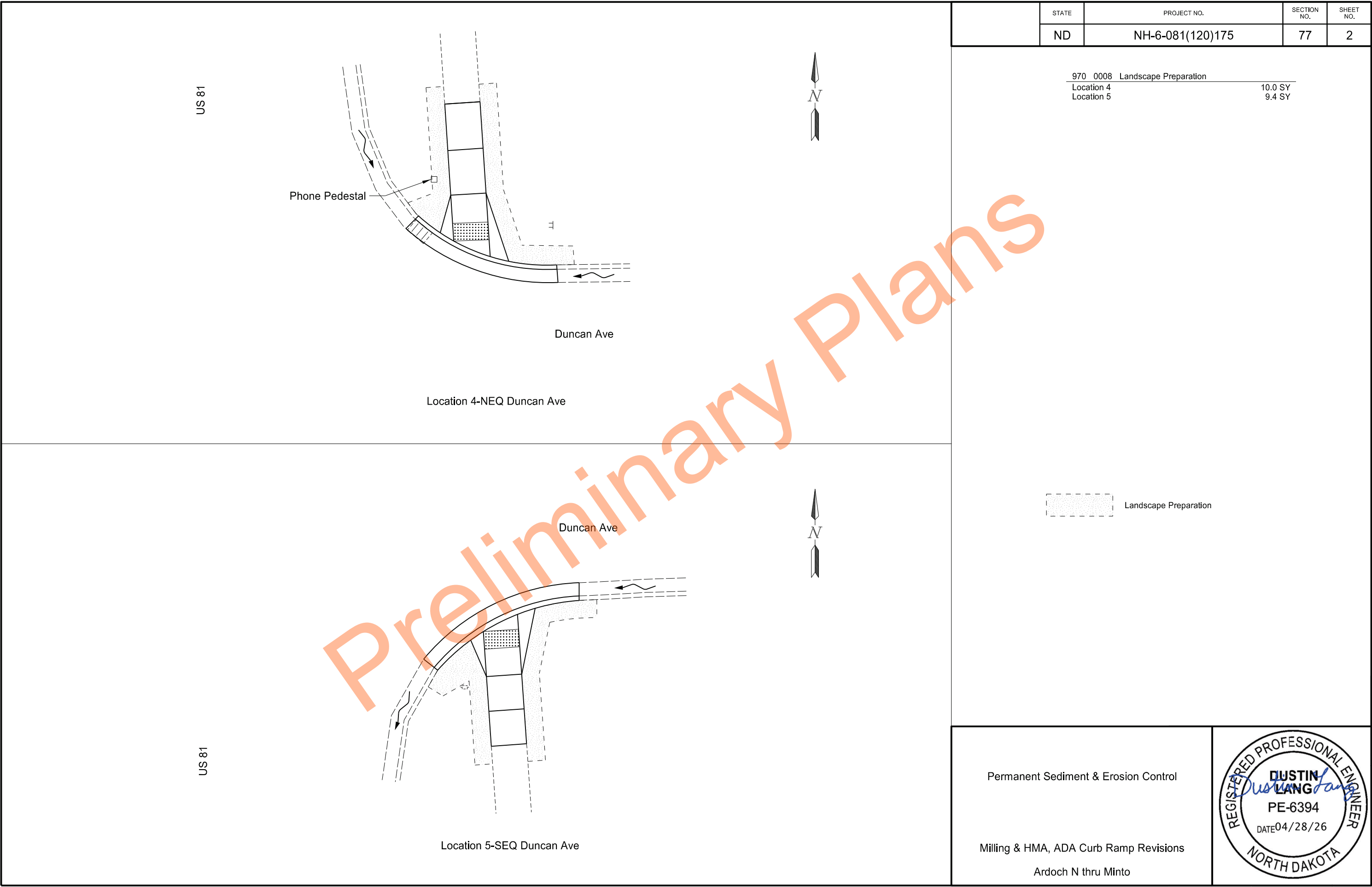


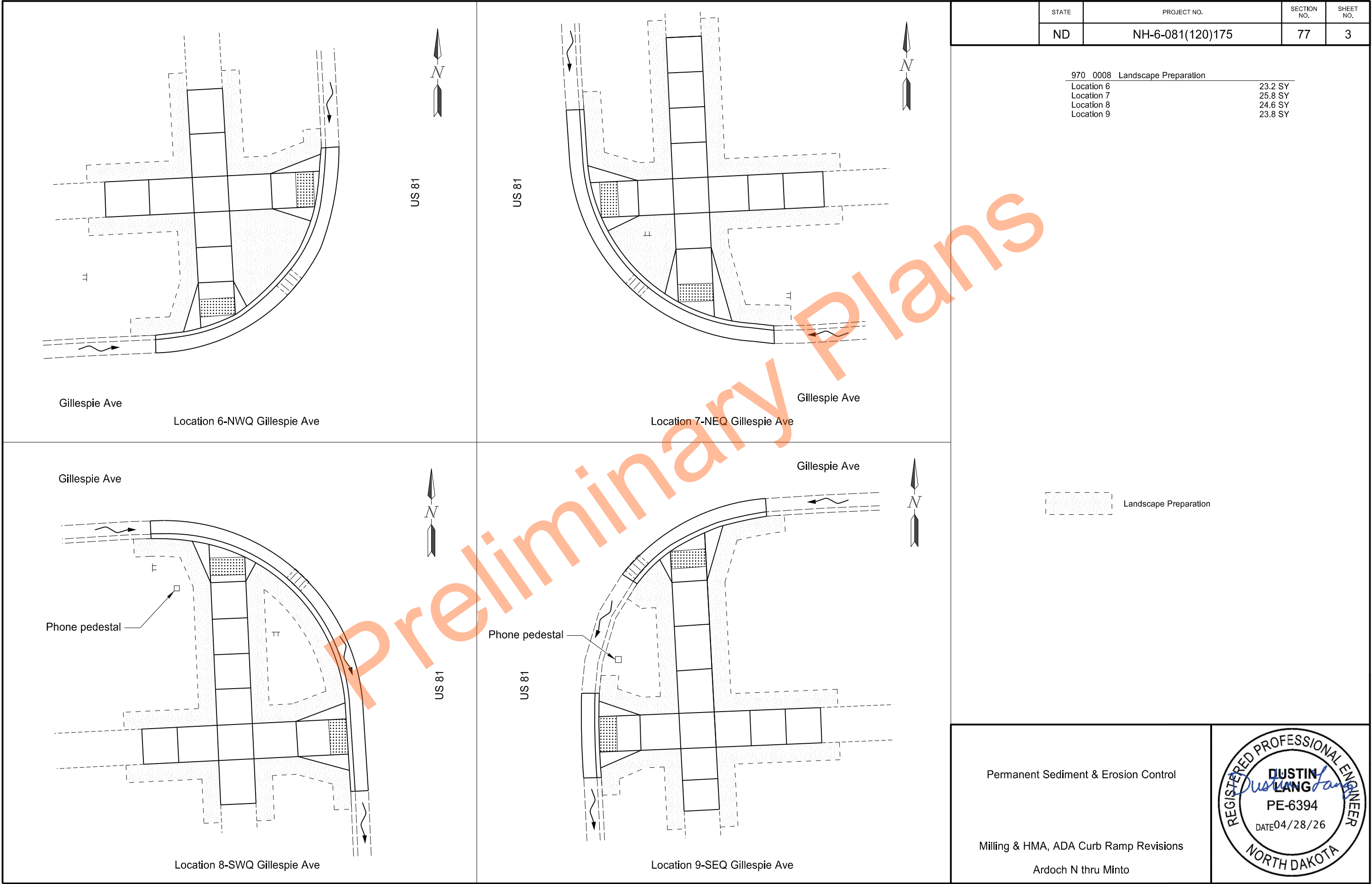






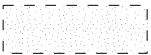






STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	77	3

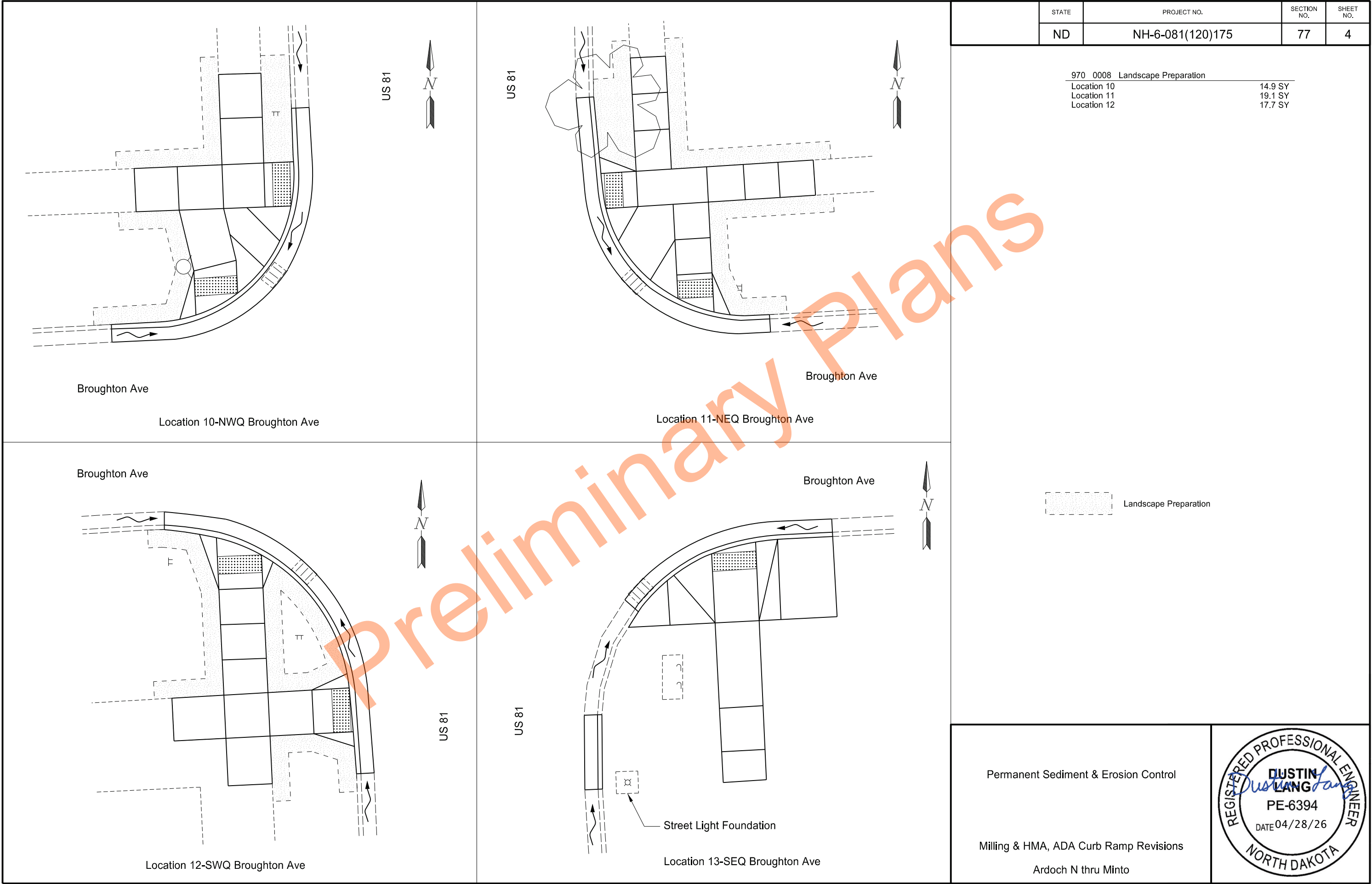
970 0008	Landscape Preparation
Location 6	23.2 SY
Location 7	25.8 SY
Location 8	24.6 SY
Location 9	23.8 SY

 Landscape Preparation

Permanent Sediment & Erosion Control

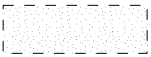
Milling & HMA, ADA Curb Ramp Revisions
Ardoch N thru Minto





STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	77	4

970 0008 Landscape Preparation	
Location 10	14.9 SY
Location 11	19.1 SY
Location 12	17.7 SY

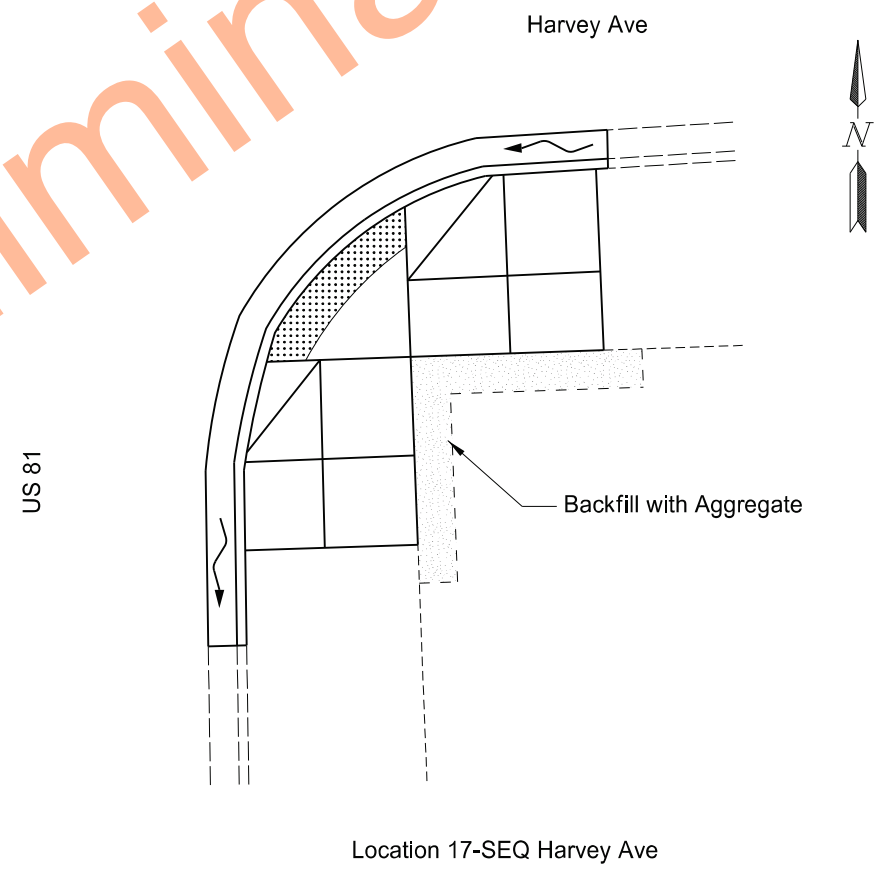
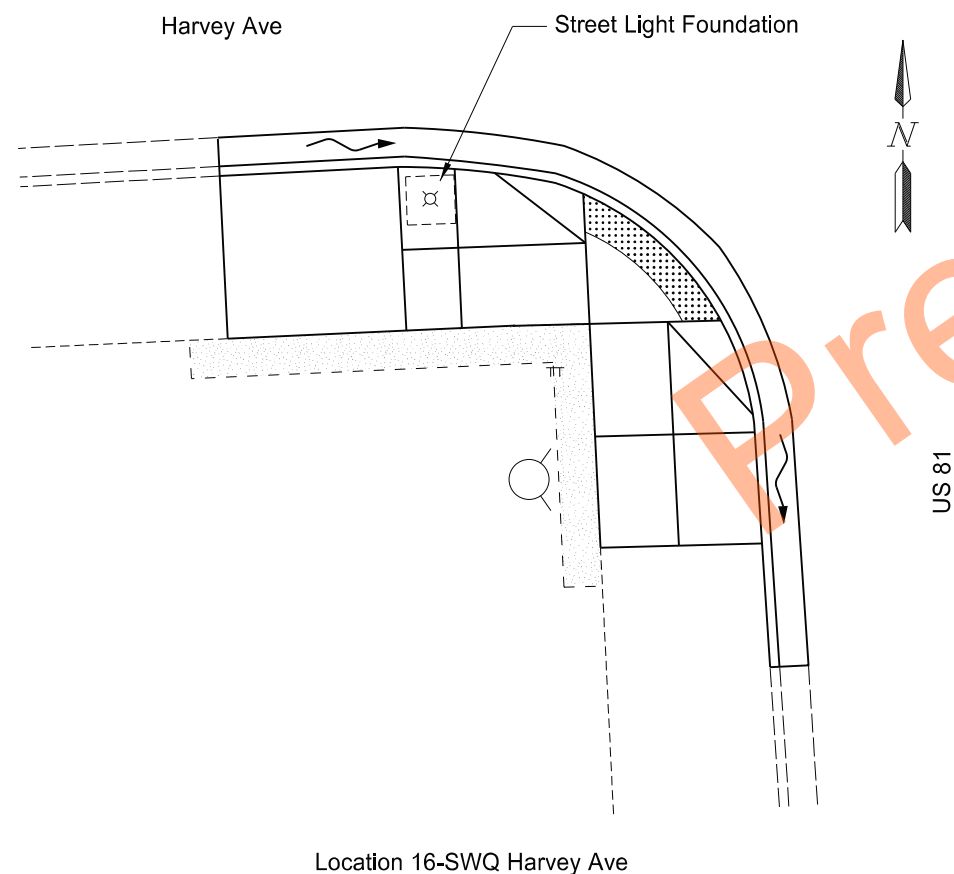
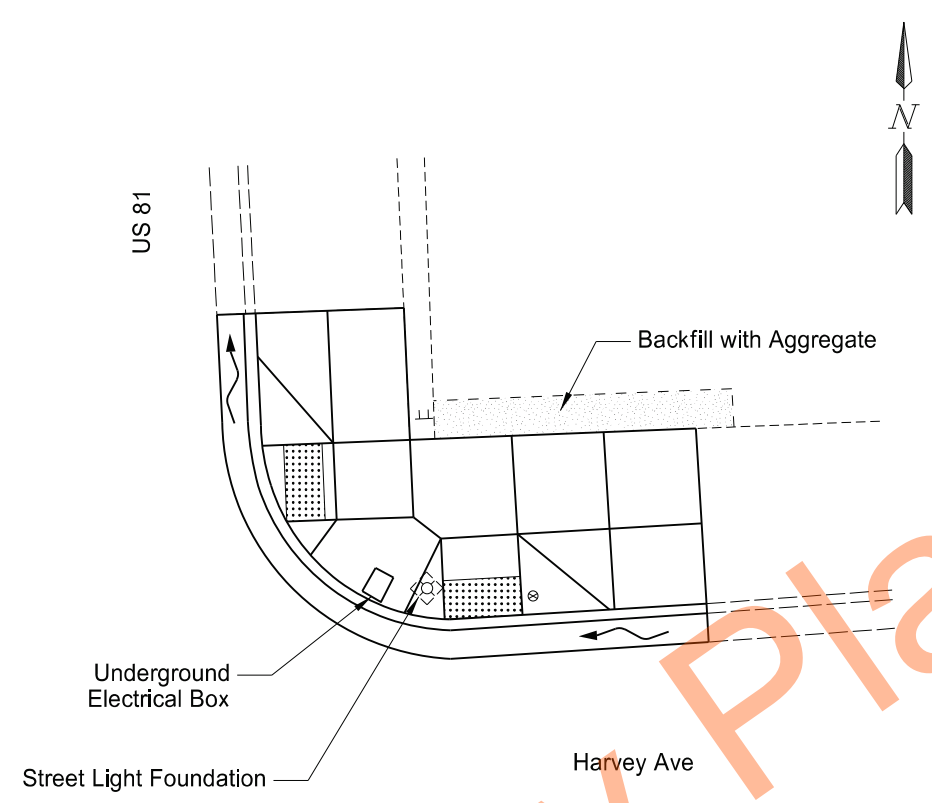
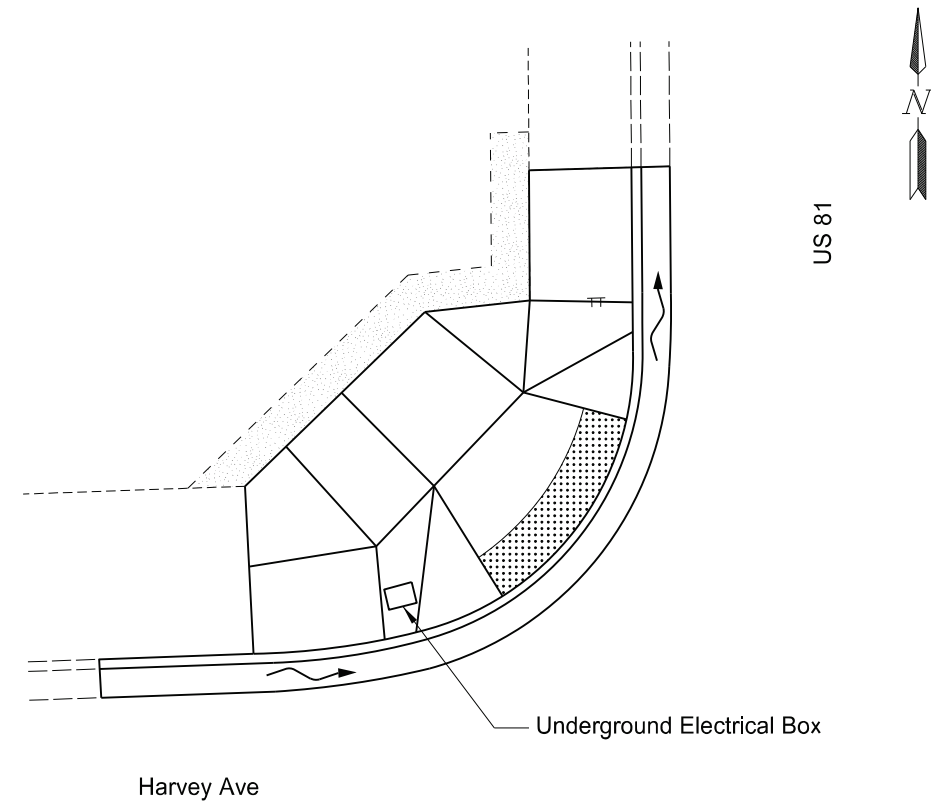
 Landscape Preparation

Permanent Sediment & Erosion Control

Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto





STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	77	5

970 0008	Landscape Preparation	
Location 14		6.1 SY
Location 15		3.5 SY
Location 16		7.2 SY
Location 17		4.9 SY

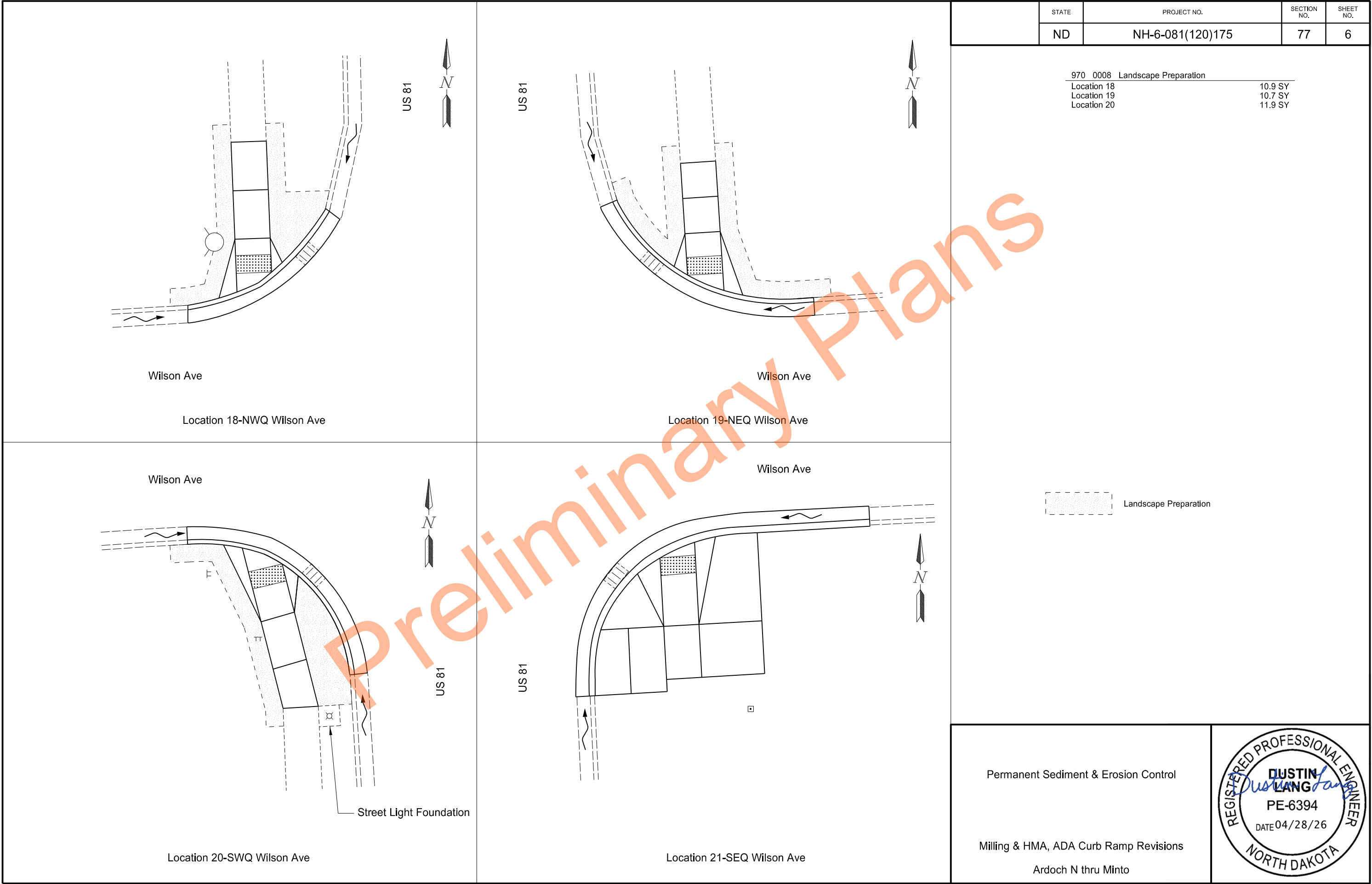
Location 14	6.1 SY
Location 15	3.5 SY
Location 16	7.2 SY
Location 17	4.9 SY

 Landscape Preparation

Permanent Sediment & Erosion Control

Milling & HMA, ADA Curb Ramp Revisions
Ardoch N thru Minto





STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	77	6

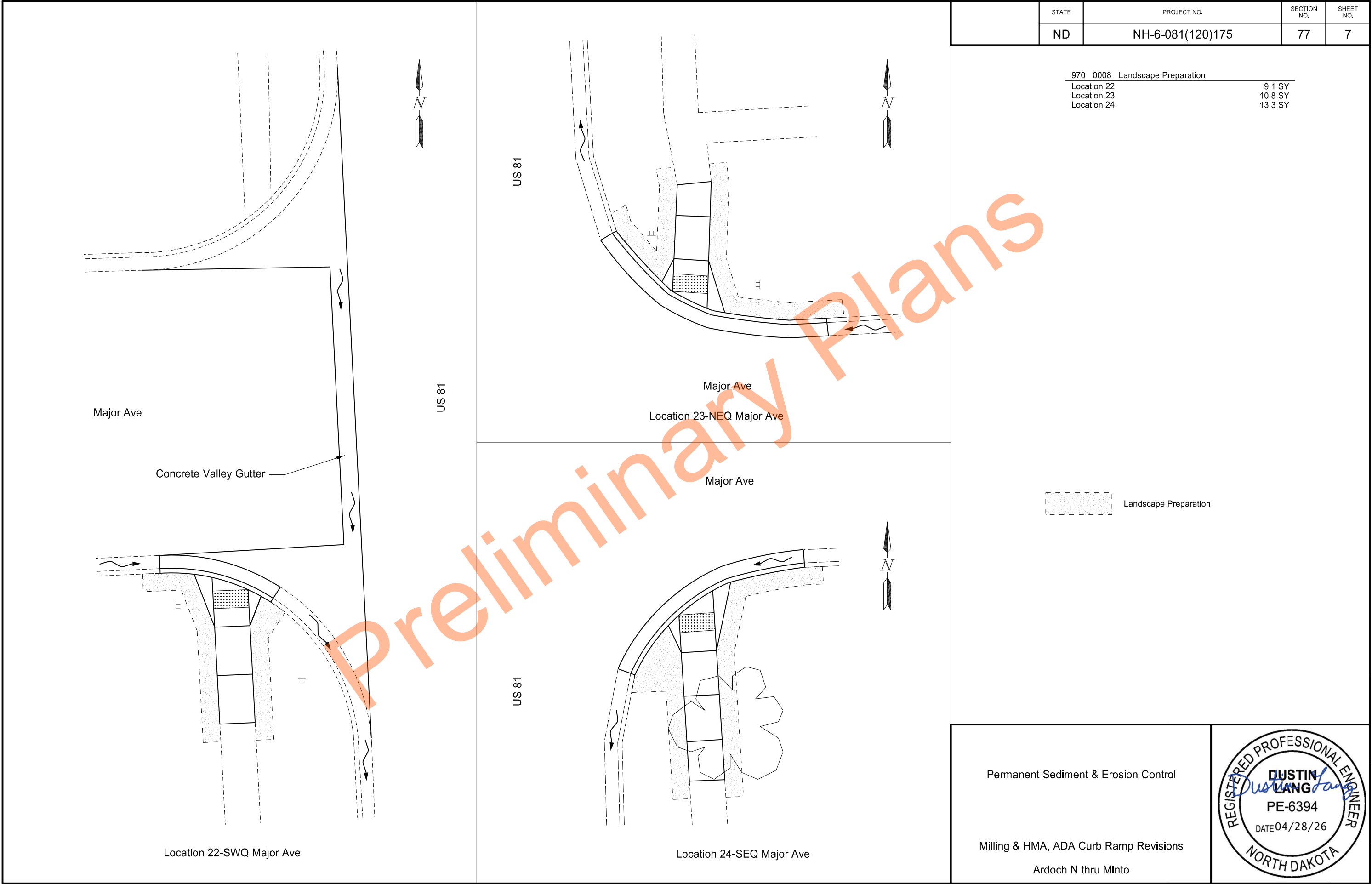
970 0008 Landscape Preparation	
Location 18	10.9 SY
Location 19	10.7 SY
Location 20	11.9 SY

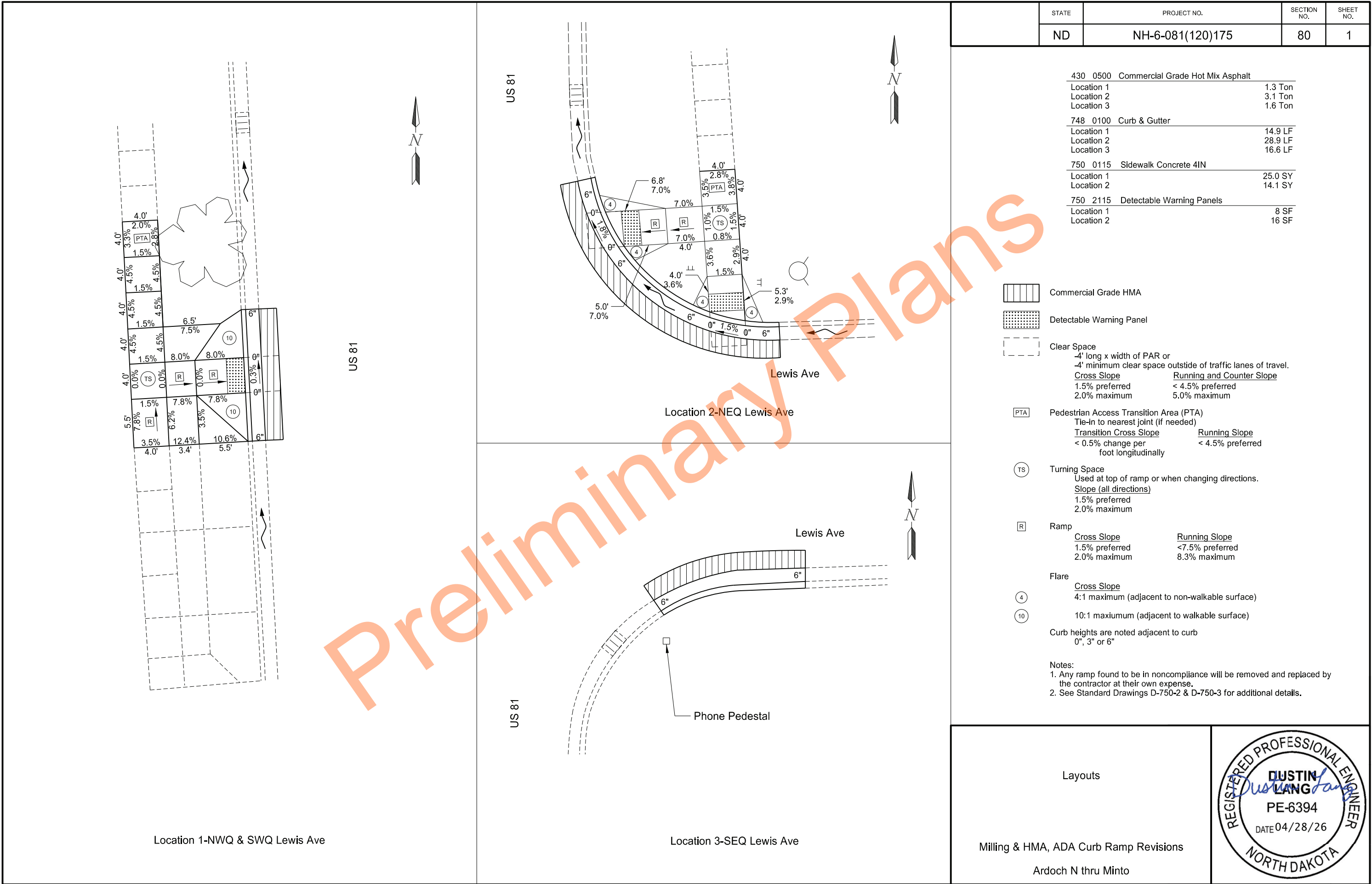
Permanent Sediment & Erosion Control

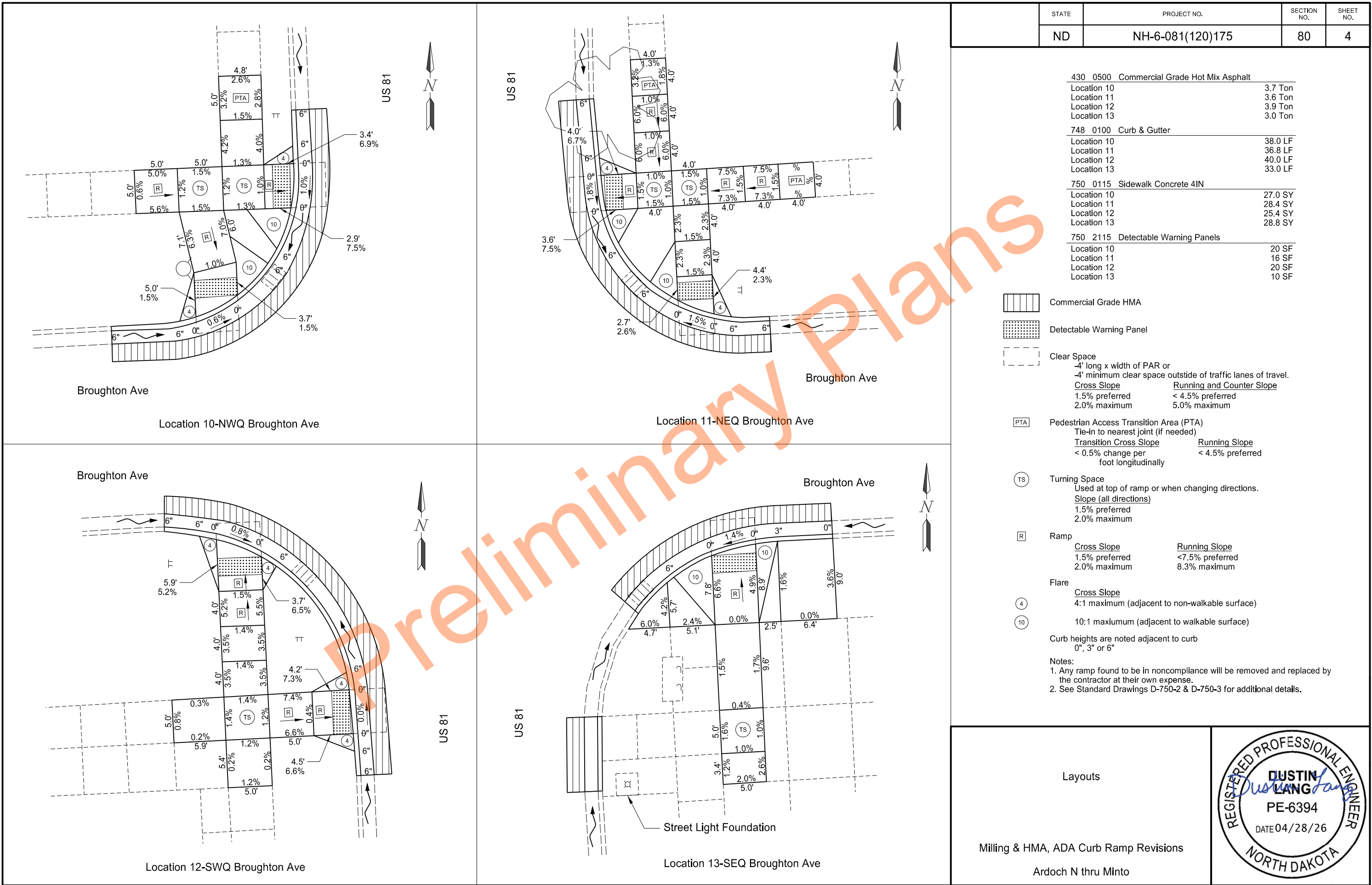
Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

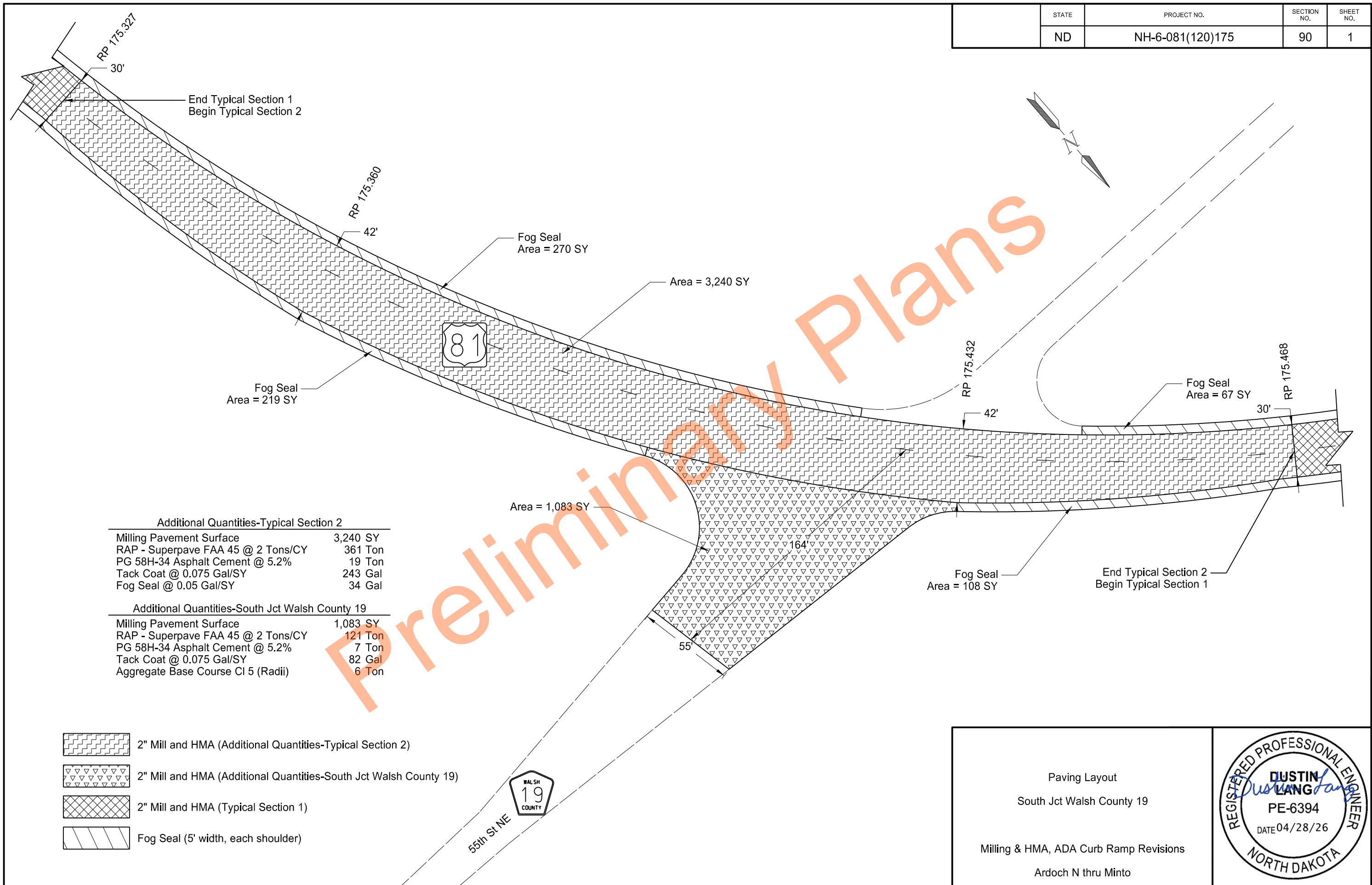




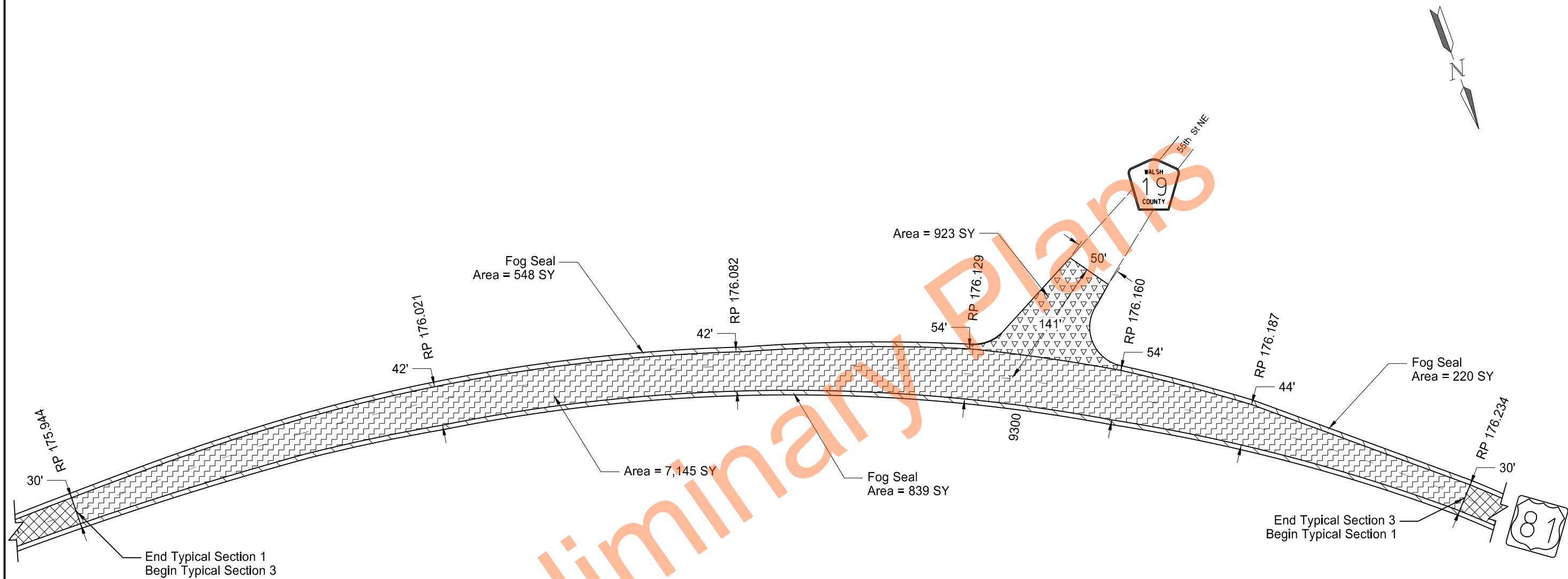


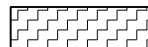
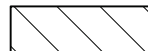


	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	90	1



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	90	2



-  2" Mill and HMA (Additional Quantities-Typical Section 3)
-  2" Mill and HMA (Additional Quantities-North Jct Walsh County 19)
-  2" Mill and HMA (Typical Section 1)
-  Fog Seal (5' width, each shoulder)

Additional Quantities-Typical Section 3	
Milling Pavement Surface	7,145 SY
RAP - Superpave FAA 45 @ 2 Tons/CY	796 Ton
PG 58H-34 Asphalt Cement @ 5.2%	42 Ton
Tack Coat @ 0.075 Gal/SY	536 Gal
Fog Seal @ 0.05 Gal/SY	81 Gal

Additional Quantities-North Jct Walsh County 19	
Milling Pavement Surface	923 SY
RAP - Superpave FAA 45 @ 2 Tons/CY	103 Ton
PG 58H-34 Asphalt Cement @ 5.2%	6 Ton
Tack Coat @ 0.075 Gal/SY	70 Gal
Aggregate Base Course Cl 5 (Radil)	6 Ton

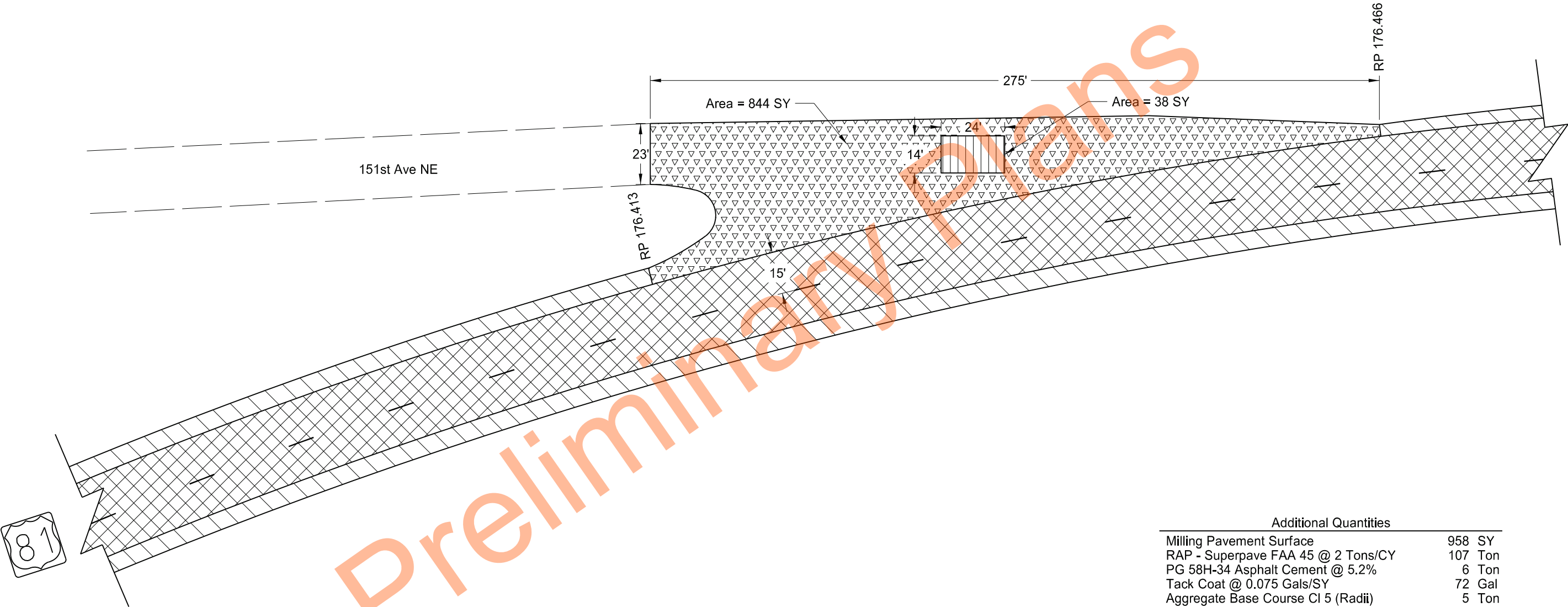
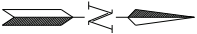
Paving Layout
North Jct Walsh County 19

Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	90	3



Additional Quantities	
Milling Pavement Surface	958 SY
RAP - Superpave FAA 45 @ 2 Tons/CY	107 Ton
PG 58H-34 Asphalt Cement @ 5.2%	6 Ton
Tack Coat @ 0.075 Gals/SY	72 Gal
Aggregate Base Course CI 5 (Radii)	5 Ton

**The quantities for a 6" mill & 6" HMA for the 38 SY shown are included in the Additional Quantities.

- 2" Mill and HMA (Additional Quantities-151st Ave NE)
- 6" Mill and HMA (Additional Quantities-151st Ave NE)
- 2" Mill and HMA (Typical Section 1)
- Fog Seal (5' width, each shoulder)

Paving Layout

Jct US 81 & 151st Ave NE

Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	100	1

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
E5-1-48	48"x48"	EXIT GORE		35	
G20-1-60	60"x24"	ROAD WORK NEXT __ MILES	3	28	84
G20-1b-60	60"x24"	NO WORK IN PROGRESS (Sign and installation only)		18	
G20-2-48	48"x24"	END ROAD WORK	2	26	52
G20-4-36	36"x18"	PILOT CAR FOLLOW ME (Mounted to back of pilot car)	1	18	18
G20-4b-36	36"x30"	WAIT FOR PILOT CAR		18	
G20-50a-72	72"x36"	ROAD WORK NEXT __ MILES RT & LT ARROWS	1	43	43
G20-52a-72	72"x24"	ROAD WORK NEXT __ MILES RT or LT ARROW	3	36	108
G20-55-96	96"x48"	SPEED LIMIT ENFORCED - MINIMUM FEE \$150 WHEN WORKERS PRESENT	2	59	118
M1-1-36	36"x36"	INTERSTATE ROUTE MARKER (Post and installation only)		11	
M1-4-24	24"x24"	U.S. ROUTE MARKER (Post and installation only)		10	
M1-5-24	24"x24"	STATE ROUTE MARKER (Post and installation only)		10	
M3-1-24	24"x12"	NORTH (Mounted on route marker post)		7	
M3-2-24	24"x12"	EAST (Mounted on route marker post)		7	
M3-3-24	24"x12"	SOUTH (Mounted on route marker post)		7	
M3-4-24	24"x12"	WEST (Mounted on route marker post)		7	
M4-8-24	24"x12"	DETOUR (Mounted on route marker post)		7	
M4-9-30	30"x24"	DETOUR ARROW RIGHT or LEFT/AHD AND RT or LT		15	
M4-10-48	48"x18"	DETOUR (INSIDE ARROW) RIGHT or LEFT (Mounted on barricade)		7	
M5-1-21	21"x15"	ADVANCE TURN ARROW RT or LT (Mounted on route marker post)		7	
M5-1-30	30"x21"	ADVANCE TURN ARROW RT or LT (Mounted on route marker post)		9	
M6-1-21	21"x15"	DIRECTIONAL ARROW RT or LT (Mounted on route marker post)		7	
M6-1-30	30"x21"	DIRECTIONAL ARROW RT or LT (Mounted on route marker post)		9	
M6-3-21	21"x15"	DIRECTIONAL ARROW UP (Mounted on route marker post)		7	
R1-1-48	48"x48"	STOP	4	32	128
R1-2-60	60"x60"	YIELD		29	
R2-1-36	36"x48"	SPEED LIMIT __ (Portable only)	8	30	240
R2-1-48	48"x60"	SPEED LIMIT __		39	
R2-1aP-24	24"x18"	MINIMUM FEE \$150 (Mounted on Speed Limit post)	4	10	40
R3-2-48	48"x48"	NO LEFT TURN		35	
R4-1-48	48"x60"	DO NOT PASS		39	
R4-7-48	48"x60"	KEEP RIGHT		39	
R5-1-48	48"x48"	DO NOT ENTER		35	
R6-1-54	54"x18"	ONE WAY RIGHT or LEFT (Mounted on STOP or DO NOT ENTER post)		14	
R7-1-12	12"x18"	NO PARKING ANY TIME		11	
R9-9-24	24"x12"	SIDEWALK CLOSED (Mounted on barricade)	18	3	54
R10-6-24	24"x36"	STOP HERE ON RED		16	
R11-2-48	48"x30"	ROAD CLOSED (Mounted on barricade)		12	
R11-2a-48	48"x30"	STREET CLOSED (Mounted on barricade)		12	
R11-3a-60	60"x30"	ROAD CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY (Mtd on barricade)		15	
R11-3c-60	60"x30"	STREET CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY (Mtd on barricade)		15	
R11-4a-60	60"x30"	STREET CLOSED TO THRU TRAFFIC (Mounted on barricade)		15	
W1-3-48	48"x48"	REVERSE TURN RIGHT or LEFT		35	
W1-4-48	48"x48"	REVERSE CURVE RIGHT or LEFT		35	
W1-4b-48	48"x48"	TWO LANE REVERSE CURVE RIGHT or LEFT		35	
W1-6-48	48"x24"	ONE DIRECTION LARGE ARROW		26	
W3-1-48	48"x48"	STOP AHEAD		35	
W3-3-48	48"x48"	SIGNAL AHEAD		35	
W3-4-48	48"x48"	BE PREPARED TO STOP	4	35	140
W3-5-48	48"x48"	SPEED REDUCTION AHEAD	4	35	140
W4-2-48	48"x48"	LANE ENDS RIGHT or LEFT		35	
W5-1-48	48"x48"	ROAD NARROWS		35	
W5-8-48	48"x48"	THRU TRAFFIC RIGHT LANE		35	
W5-9-48	48"x48"	ROAD WORK TRAFFIC ONLY DOWN & LT or RT ARROW		35	
W6-3-48	48"x48"	TWO WAY TRAFFIC		35	
W8-1-48	48"x48"	BUMP	6	35	210
W8-3-48	48"x48"	PAVEMENT ENDS		35	
W8-7-48	48"x48"	LOOSE GRAVEL		35	
W8-11-48	48"x48"	UNEVEN LANES	4	35	140
W8-12-48	48"x48"	NO CENTER LINE	4	35	140
W8-17-48	48"x48"	SHOULDER DROP-OFF SYMBOL		35	
W8-53-48	48"x48"	TRUCKS ENTERING HIGHWAY		35	
W8-54-48	48"x48"	TRUCKS ENTERING AHEAD or __ FT or __ MILE	2	35	70
W8-55-48	48"x48"	TRUCKS CROSSING AHEAD or __ FT or __ MILE	2	35	70
W8-56-48	48"x48"	TRUCKS EXITING HIGHWAY		35	
W9-3a-48	48"x48"	CENTER LANE CLOSED SYMBOL		35	
W13-1P-30	30"x30"	__ MPH ADVISORY SPEED PLAQUE (Mounted on warning sign post)		14	
W14-3-64	64"x48"	NO PASSING ZONE		28	
W16-2P-30	30"x24"	__ FEET PLAQUE (Mounted on warning sign post)		10	
W20-1-48	48"x48"	ROAD WORK AHEAD or __ FT or __ MILE	22	35	770
W20-2-48	48"x48"	DETOUR AHEAD or __ FT or __ MILE		35	
W20-3-48	48"x48"	ROAD or STREET CLOSED AHEAD or __ FT or __ MILE		35	
W20-4-48	48"x48"	ONE LANE ROAD AHEAD or __ FT or __ MILE		35	
W20-5-48	48"x48"	RIGHT or CENTER or LEFT LANE CLOSED AHEAD or __ FT or __ MILE		35	
W20-7-48	48"x48"	FLAGGER	5	35	175
W20-8-18	18"x18"	STOP - SLOW PADDLE Back to Back	5	5	25
W20-52P-54	54"x12"	NEXT __ MILES (Mounted on warning sign post)		12	
W21-1-48	48"x48"	WORKERS		35	
W21-2-48	48"x48"	FRESH OIL	2	35	70
W21-3-48	48"x48"	ROAD MACHINERY AHEAD or __ FT or __ MILE		35	
W21-5-48	48"x48"	SHOULDER WORK		35	
W21-5a-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED		35	

[illegible][illegible]

SPEC & CODE			
704-1000	TRAFFIC CONTROL SIGNS	TOTAL UNITS	2940

SPEC & CODE	DESCRIPTION	UNIT	QUANTITY
704-0100	FLAGGING	MHR	540
704-1048	PORTABLE RUMBLE STRIPS	EACH	3
704-1050	TYPE I BARRICADES	EACH	
704-1052	TYPE III BARRICADES	EACH	
704-1054	SIDEWALK BARRICADE	EA	18
704-1058	PEDESTRIAN WALKWAY	LF	1200
704-1060	DELINEATOR DRUMS	EACH	
704-1065	TRAFFIC CONES	EACH	
704-1067	TUBULAR MARKERS	EACH	280
704-1070	DELINEATOR	EACH	
704-1072	FLEXIBLE DELINEATORS	EACH	
704-1080	STACKABLE VERTICAL PANELS	EACH	45
704-1081	VERTICAL PANELS - BACK TO BACK	EACH	
704-1085	SEQUENCING ARROW PANEL - TYPE A	EACH	
704-1086	SEQUENCING ARROW PANEL - TYPE B	EACH	
704-1087	SEQUENCING ARROW PANEL - TYPE C	EACH	
704-1185	PILOT CAR	HR	180
704-1500	OBLITERATION OF PVMT MK	SF	
704-2108	TEMPORARY CURB RAMP	EA	18
704-3501	PORTABLE PRECAST CONCRETE MED BARRIER	LF	
704-3510	PRECAST CONCRETE MED BARRIER - STATE FURNISHED	EACH	
762-0200	RAISED PAVEMENT MARKERS	EACH	
762-0420	SHORT TERM 4IN LINE - TYPE R	LF	
762-0430	SHORT TERM 4IN LINE - TYPE NR	LF	
762-0432	SHORT TERM 6IN LINE-TYPE NR	LF	48138

NOTE:
If additional signs are required, units will be calculated using the formula from Section III-18.06 of the Design Manual.
<http://www.dot.nd.gov/>

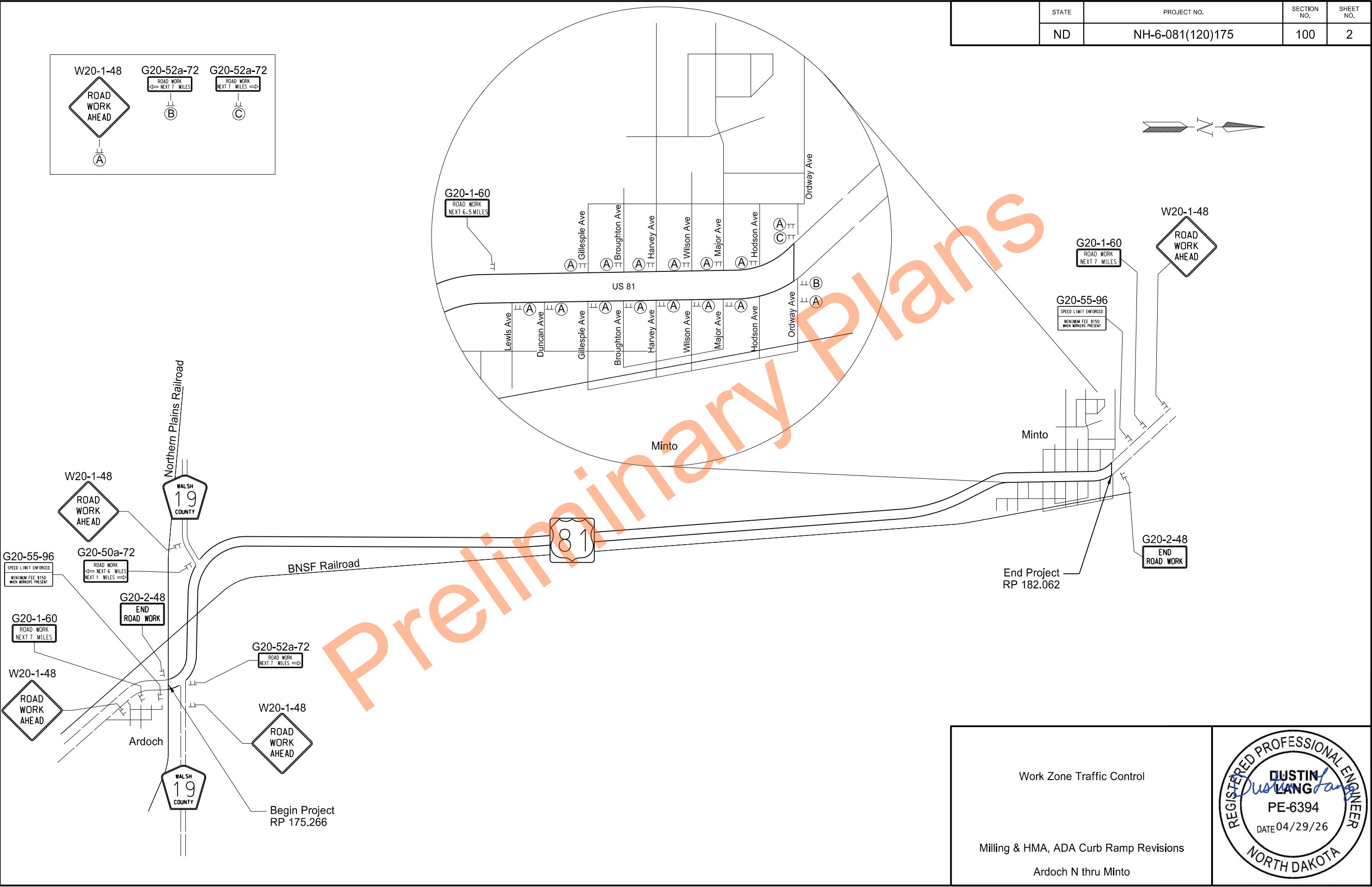
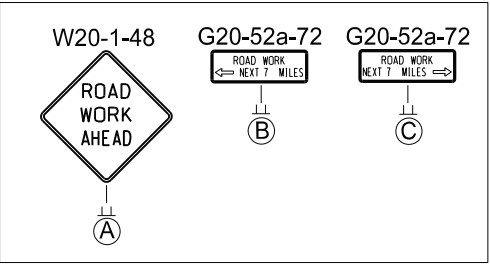


Traffic Control Devices List

Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	100	2



Work Zone Traffic Control

Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

REGISTERED PROFESSIONAL ENGINEER

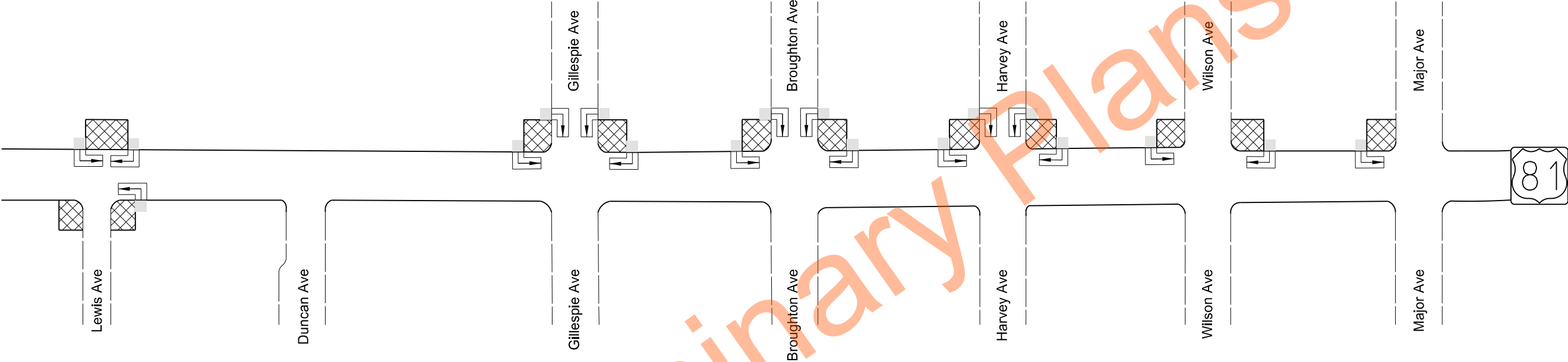
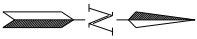
DUSTIN LANG

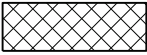
PE-6394

DATE 04/29/26

NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	100	3



-  ADA Curb Ramp Revision
-  Temporary Curb Ramp
-  Temporary Pedestrian Surfacing

Construction Phasing
ADA Curb Ramp Revisions

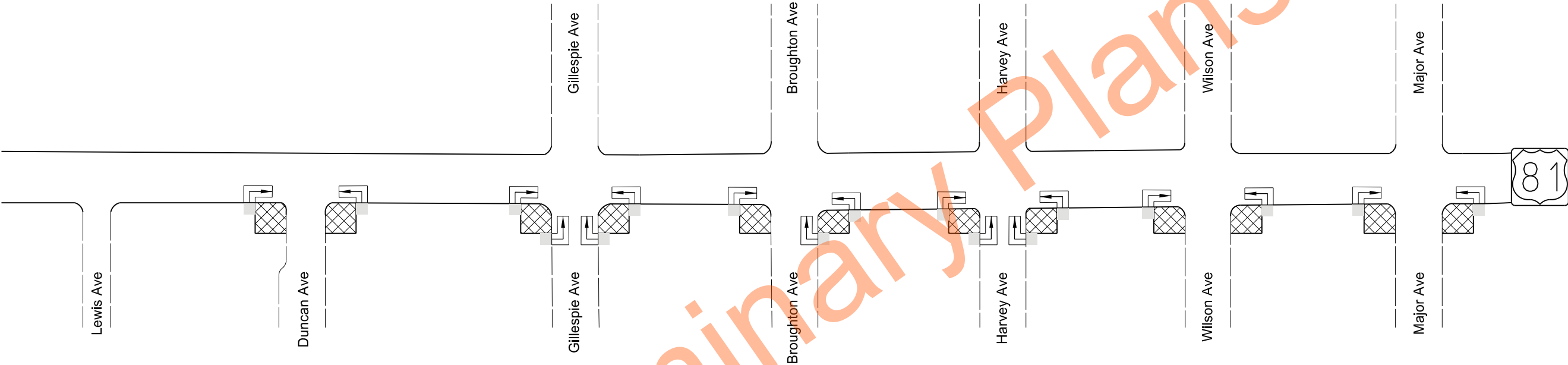
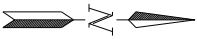
Phase 1

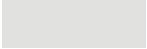
Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	100	4

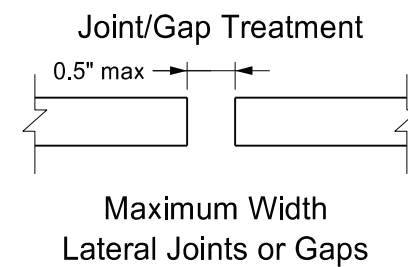
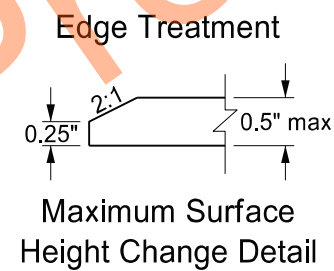
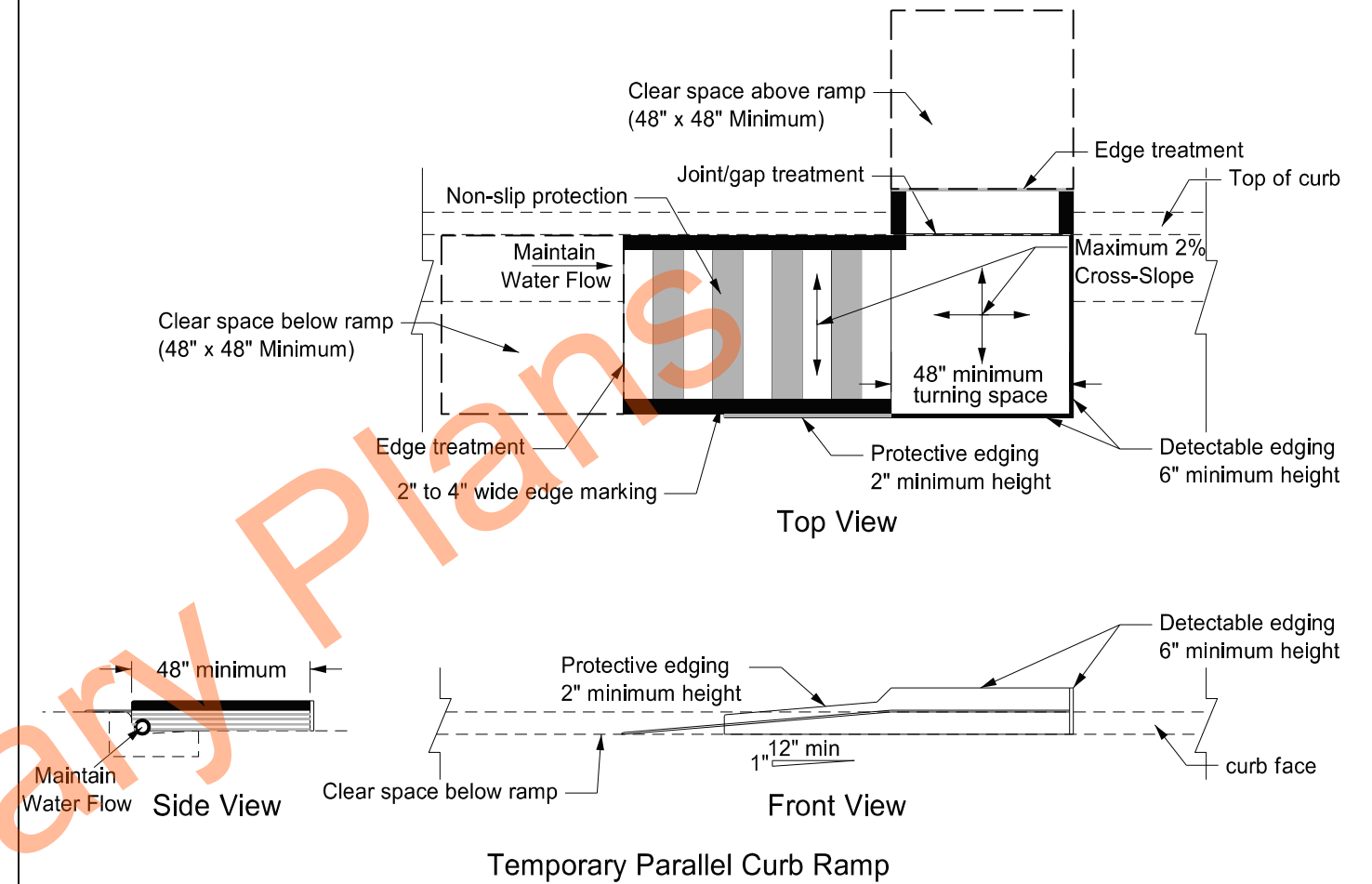
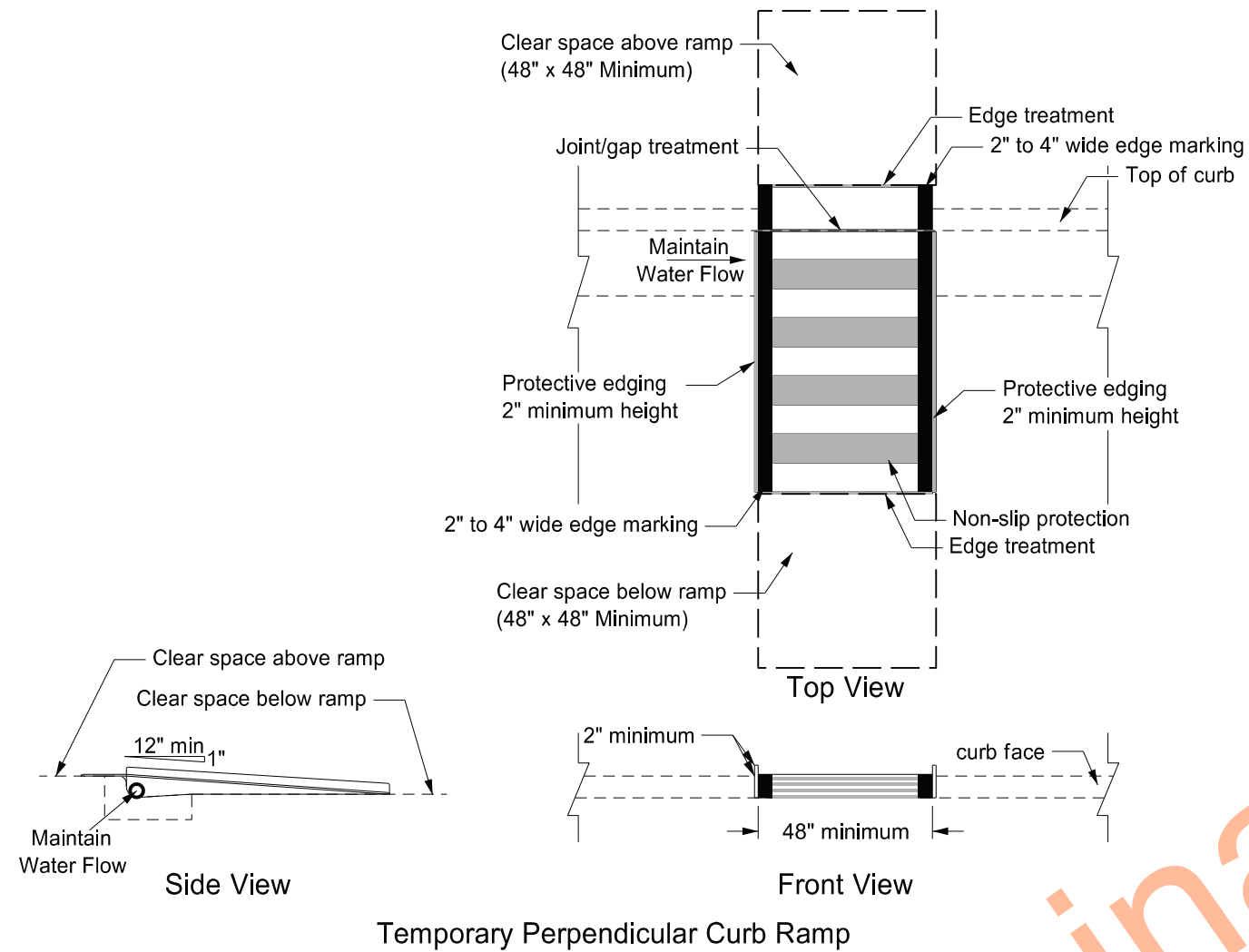


-  ADA Curb Ramp Revision
-  Temporary Curb Ramp
-  Temporary Pedestrian Surfacing

Construction Phasing
ADA Curb Ramp Revisions
Phase 2
Milling & HMA, ADA Curb Ramp Revisions
Ardoch N thru Minto



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	100	5



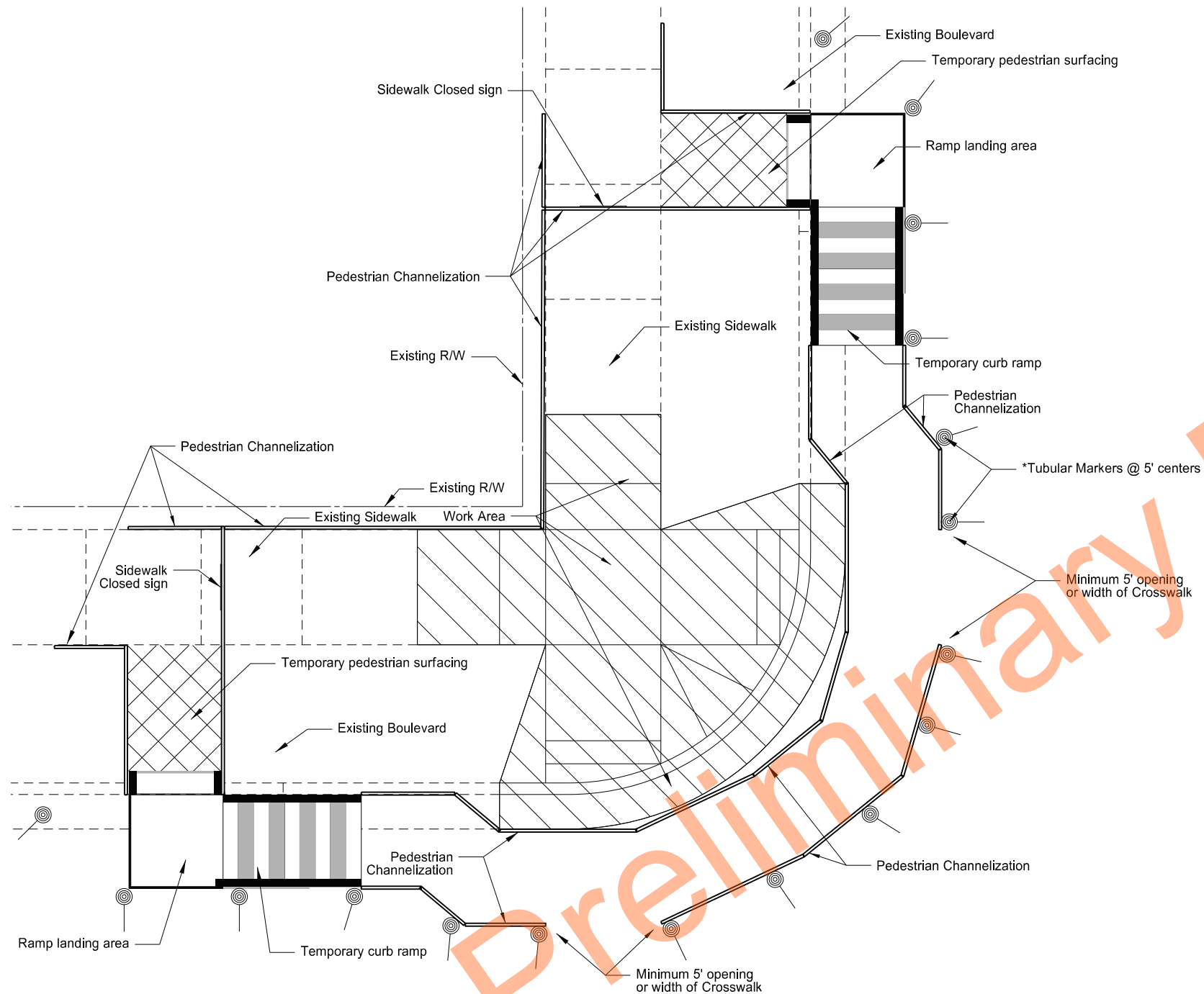
Temporary Pedestrian Curb Ramp Details

Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	100	6



*NOTE: Eliminate tubular markers if pedestrian channelization is retro-reflective

Temporary Pedestrian Access Route

Milling & HMA, ADA Curb Ramp Revisions
Ardoch N thru Minto

REGISTERED PROFESSIONAL ENGINEER

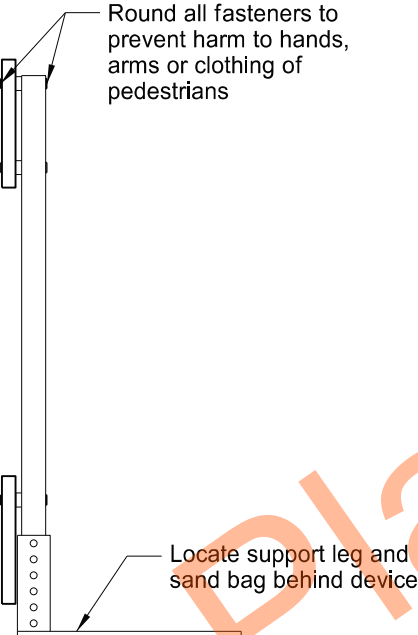
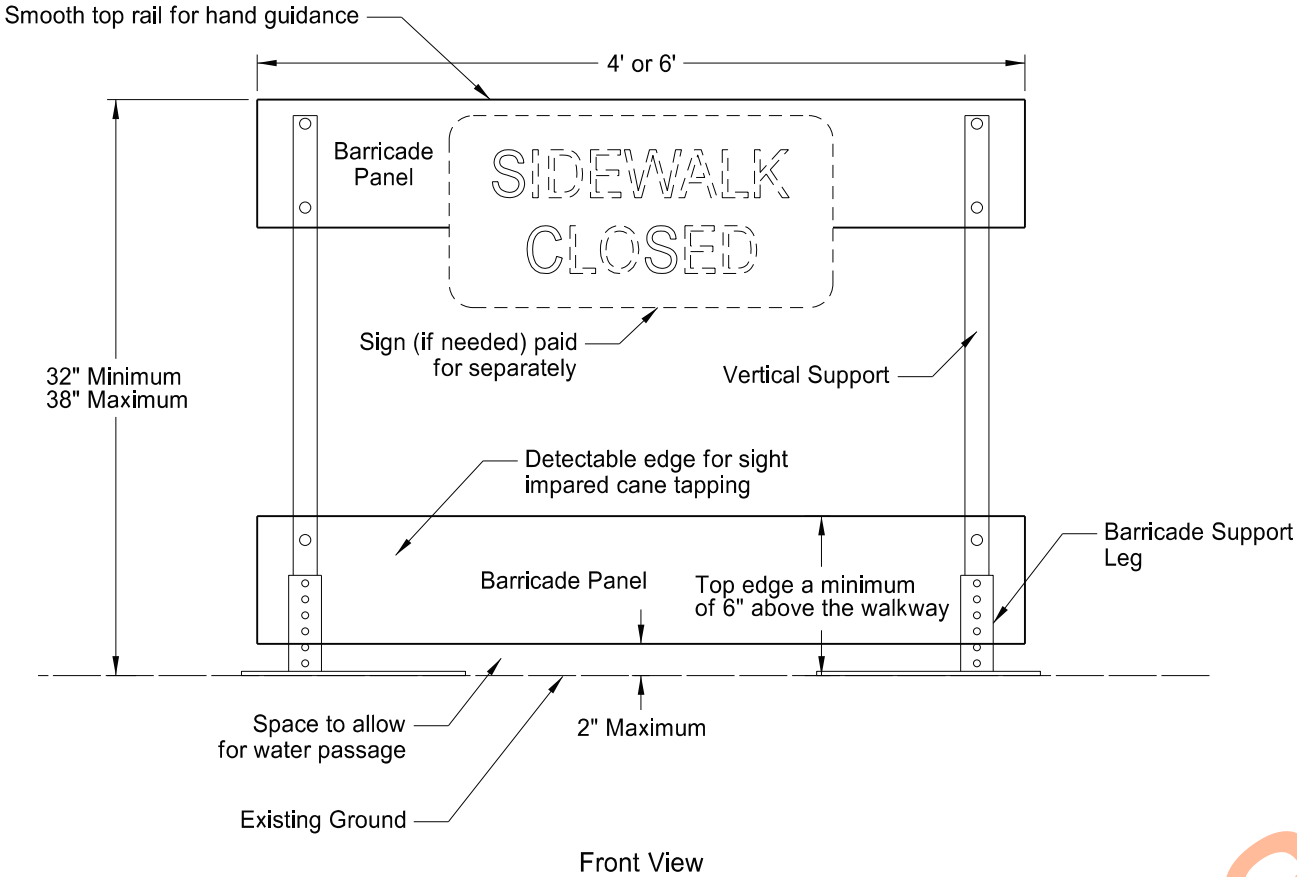
DUSTIN LANG

PE-6394

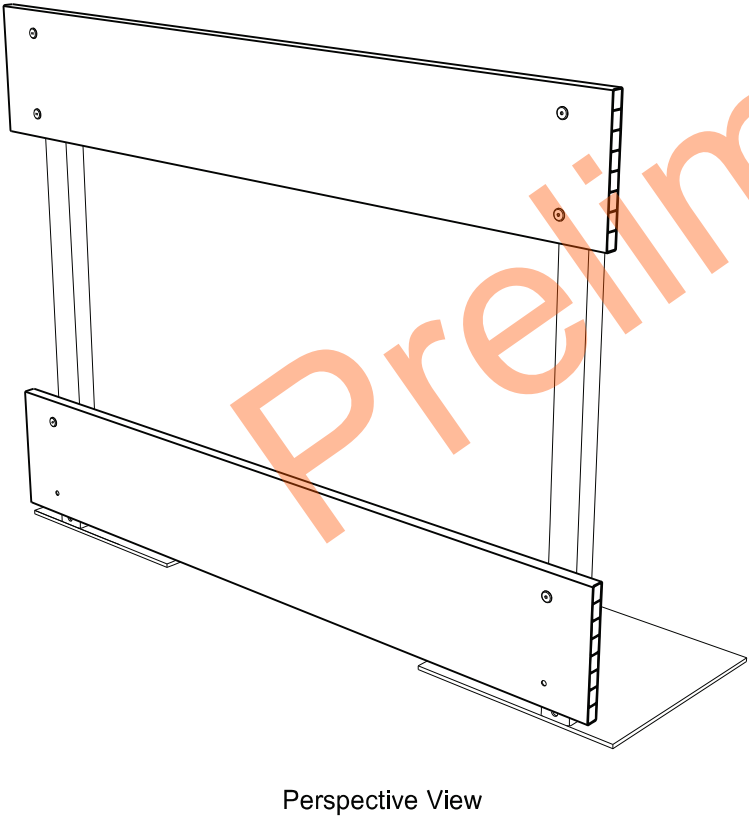
DATE 04/29/26

NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	100	7



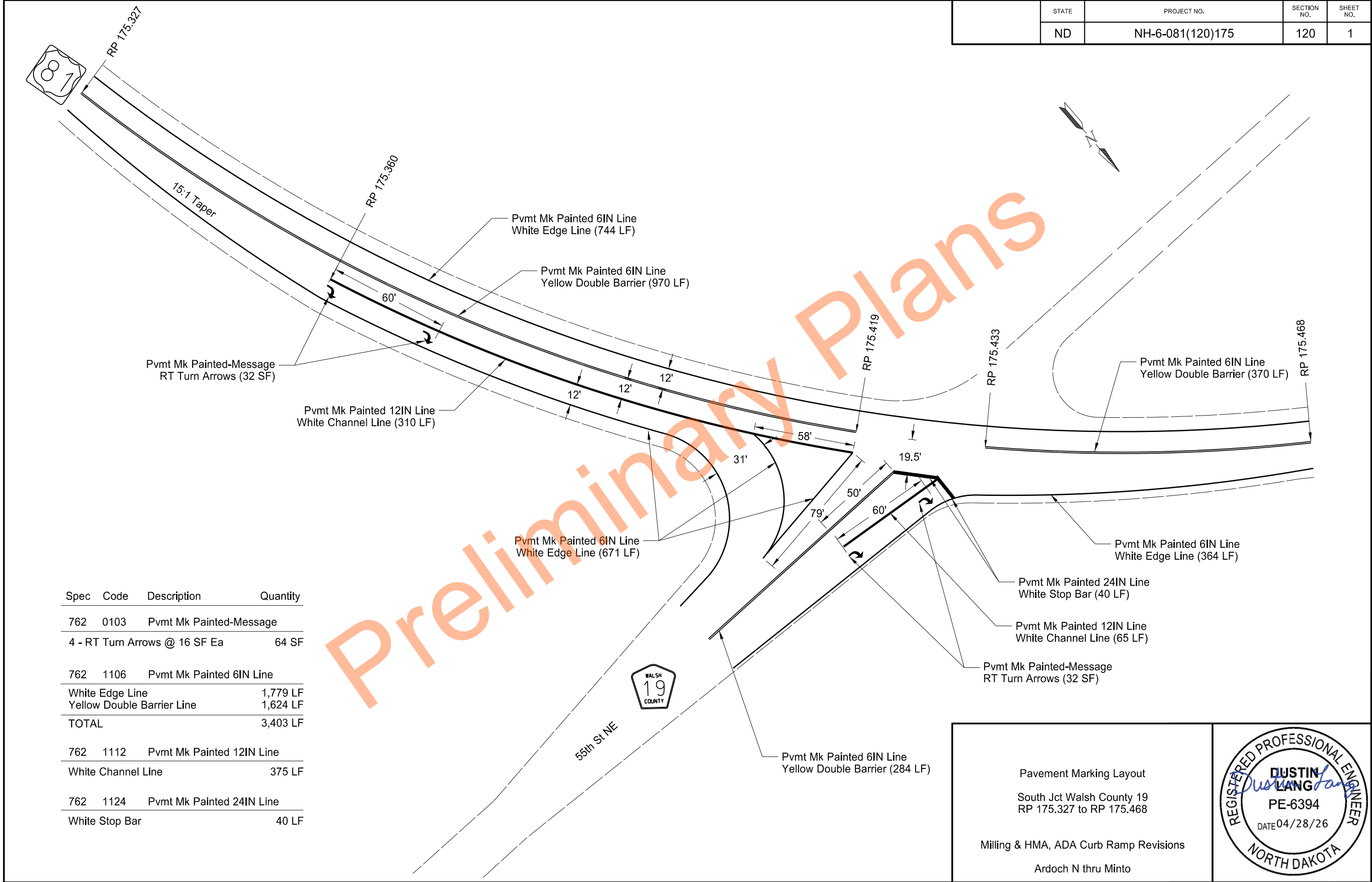
- NOTES:
- Sidewalk Barricades**
1. Provide self standing sidewalk barricade with no supports extending into the pedestrian's path.
 2. Use orange or orange and white diagonal striped barricade panels contrasting with the walkway surface.
 3. Provide ADA compliant and NCHRP 350 or Mash Test Level 3 (TL3) approved sidewalk barricades.
 4. Include all costs to furnish, maintain and remove sidewalk barricades in the price bid for "Sidewalk Barricade".



Sidewalk Barricade

Milling & HMA, ADA Curb Ramp Revisions
Ardoch N thru Minto

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	120	1



Spec	Code	Description	Quantity
762	0103	Pvmt Mk Painted-Message	
		4 - RT Turn Arrows @ 16 SF Ea	64 SF
762	1106	Pvmt Mk Painted 6IN Line	
		White Edge Line	1,779 LF
		Yellow Double Barrier Line	1,624 LF
		TOTAL	3,403 LF
762	1112	Pvmt Mk Painted 12IN Line	
		White Channel Line	375 LF
762	1124	Pvmt Mk Painted 24IN Line	
		White Stop Bar	40 LF

Pavement Marking Layout

South Jct Walsh County 19
RP 175.327 to RP 175.468

Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

REGISTERED PROFESSIONAL ENGINEER

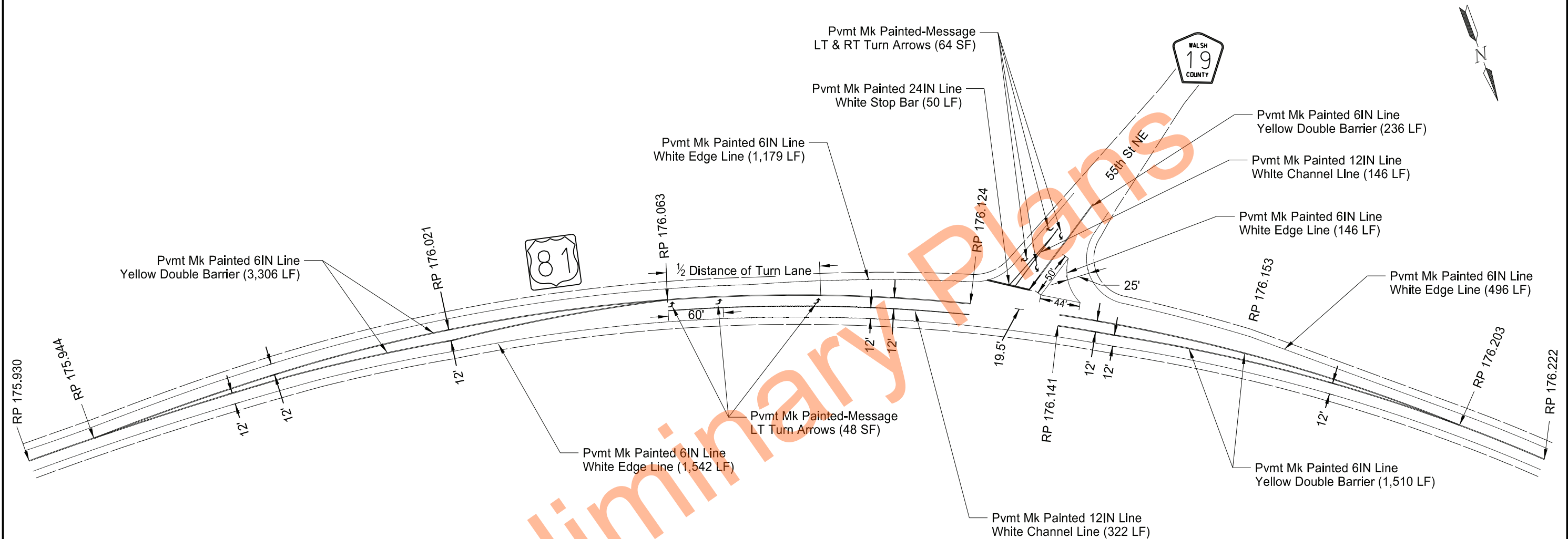
DUSTIN LANG

PE-6394

DATE 04/28/26

NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	120	2



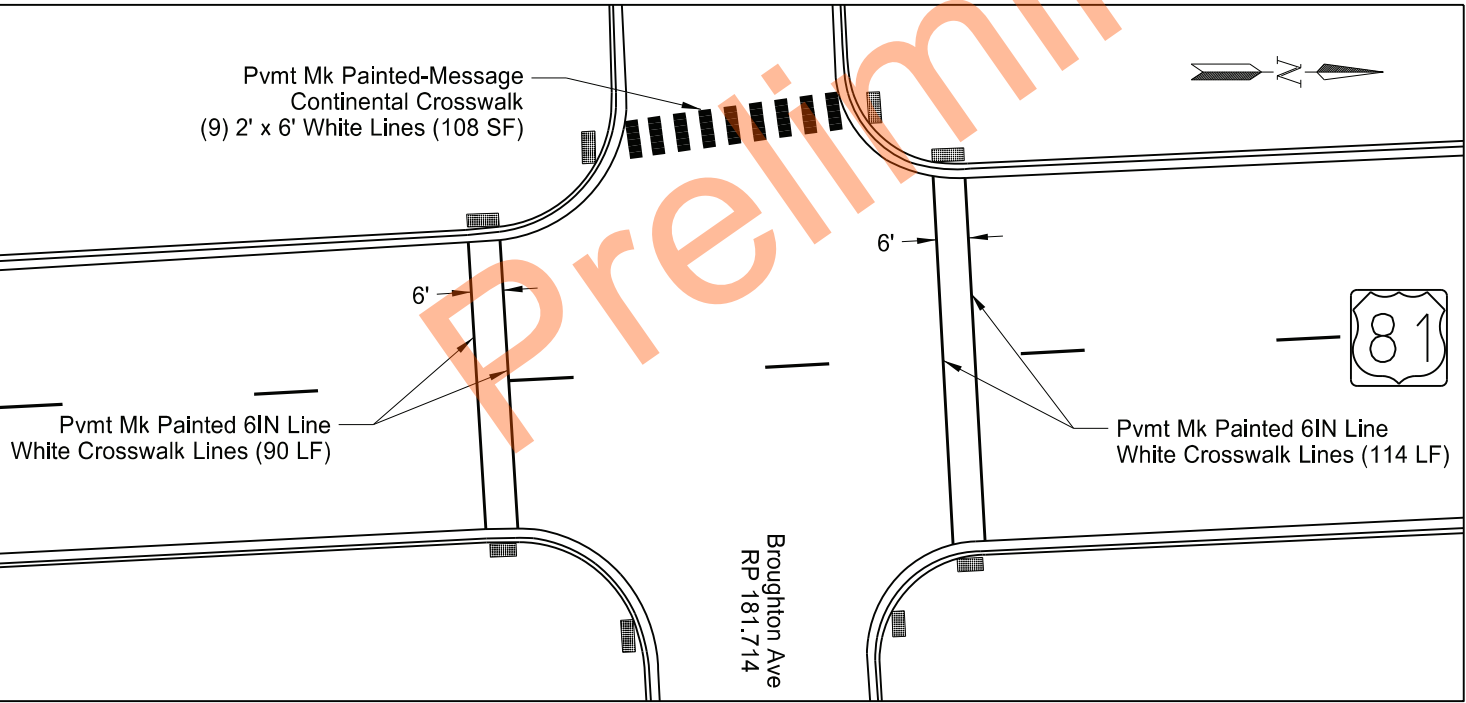
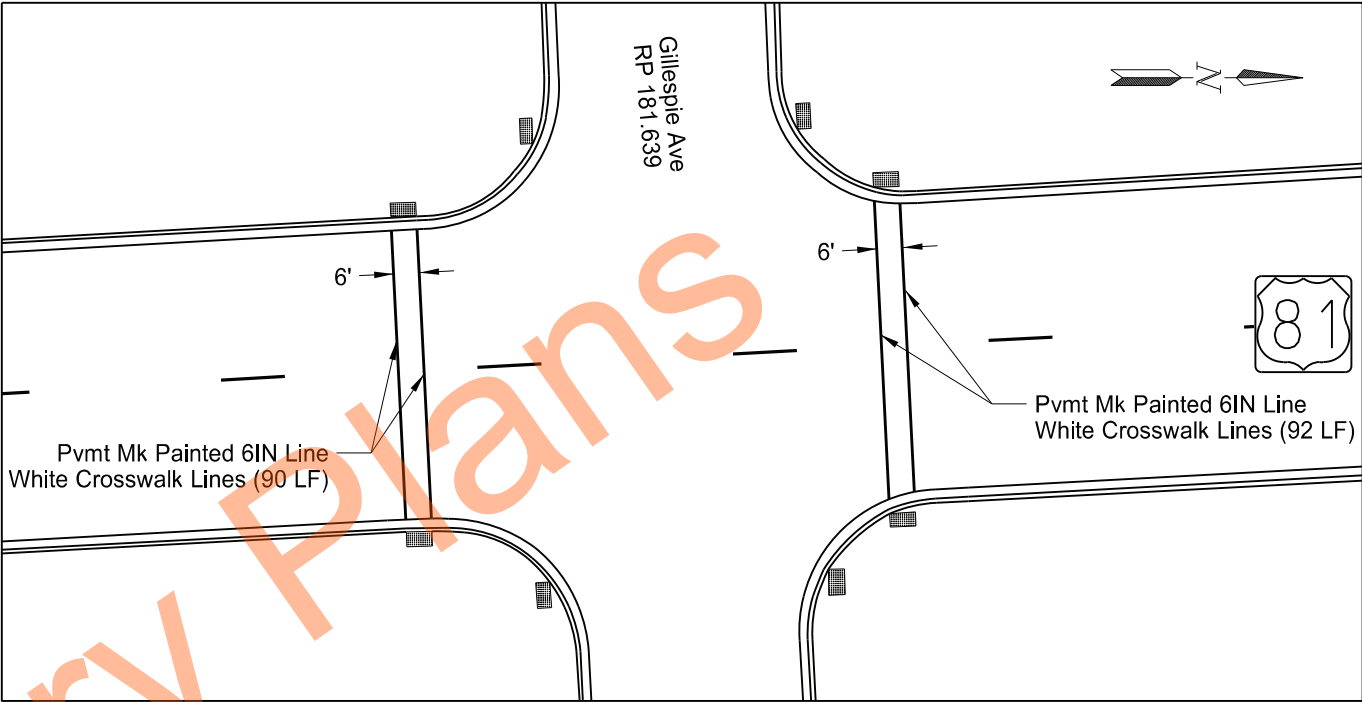
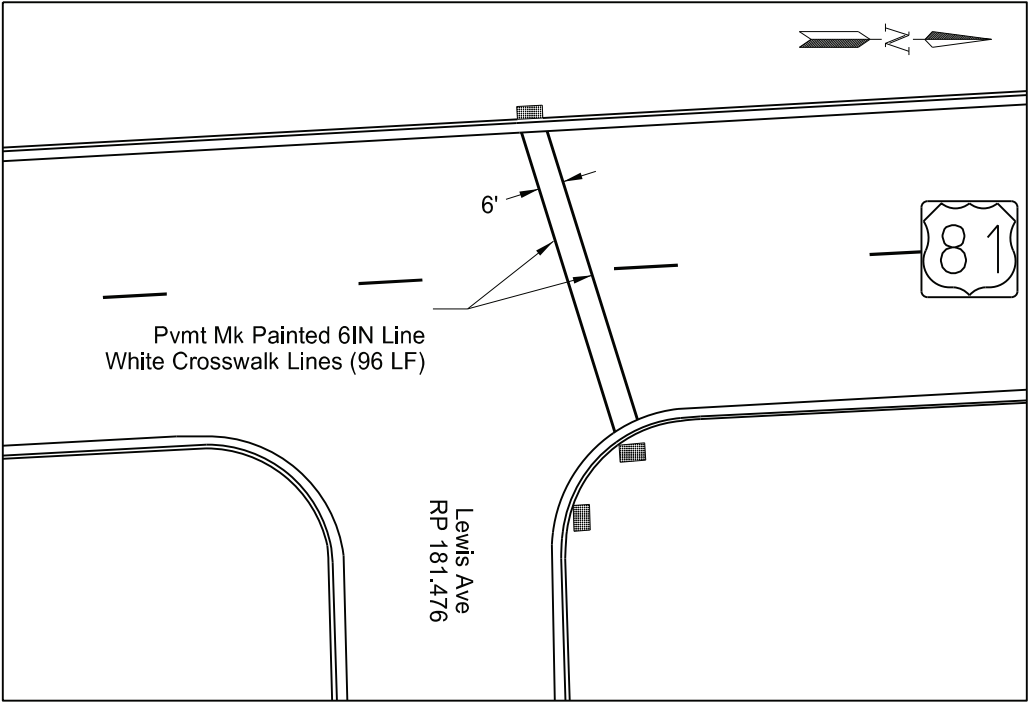
Spec Code	Description	Quantity
762 0103	Pvmt Mk Painted-Message	
5-LT Turn Arrows @ 16 SF Ea		80 SF
2-RT Turn Arrows @ 16 SF Ea		32 SF
TOTAL		112 SF
762 1106	Pvmt Mk Painted 6IN Line	
White Edge Line		3,363 LF
Yellow Double Barrier Line		5,052 LF
TOTAL		8,415 LF
762 1112	Pvmt Mk Painted 12IN Line	
White Channel Line		468 LF
762 1124	Pvmt Mk Painted 24IN Line	
White Stop Bar		50 LF

Pavement Marking Layout
North Jct Walsh County 19
RP 175.930 to RP 176.222

Milling & HMA, ADA Curb Ramp Revisions
Ardoch N thru Minto



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	120	3



Spec	Code	Description	Quantity
762	0103	Pvmt Mk Painted-Message Continental Crosswalk	108 SF
762	1106	Pvmt Mk Painted 6IN Line White Crosswalk Lines	482 LF

Pavement Marking Layout

City of Minto-Crosswalks

Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

REGISTERED PROFESSIONAL ENGINEER

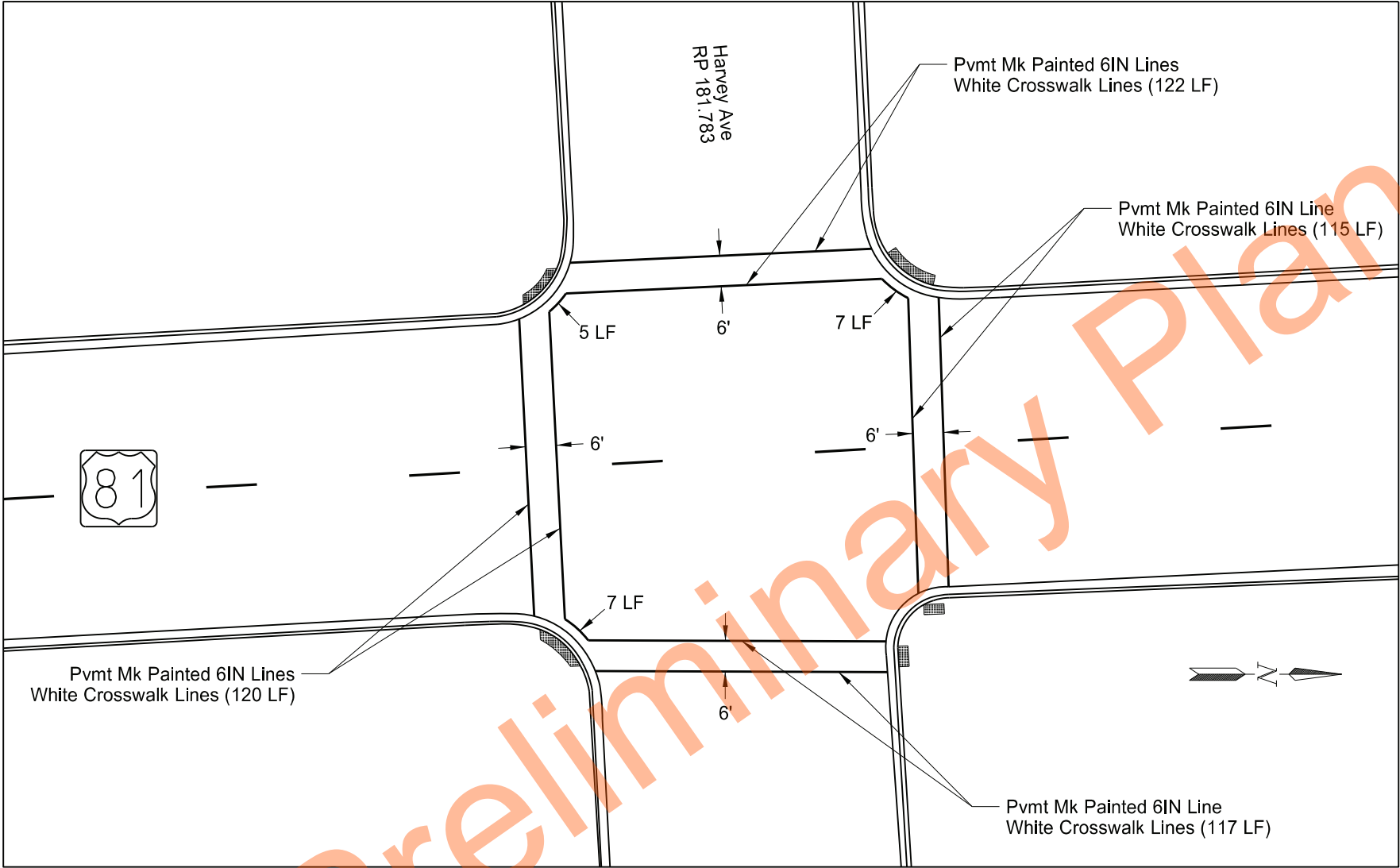
DUSTIN LANG

PE-6394

DATE 04/28/26

NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	120	4



Spec	Code	Description	Quantity
762	1106	Pvmt Mk Painted 6IN Line White Crosswalk Lines	493 LF

Pavement Marking Layout

City of Minto-Crosswalks

Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

REGISTERED PROFESSIONAL ENGINEER

DUSTIN LANG

PE-6394

DATE 04/28/26

NORTH DAKOTA

NDDOT ABBREVIATIONS

D-101-1

?	This is a special text character used in the labeling of existing features. It indicates a feature that has an unknown characteristic, potentially based on: lack of description, location accuracy or purpose.	C Gdrl	cable guardrail	Culv	culvert	FOS	factor of safety
Abn	abandoned	Calc	calculate	C&G	curb & gutter	Fed	Federal
Abut	abutment	CIP	cast iron pipe	CI	curb inlet	FP	feed point
Adj	adjusted	CB	catch basin	CR	curb ramp	Fn	fence
Aggr	aggregate	CRS	cationic rapid setting	C	cut	Fn P	fence post
Ahd	ahead	C Gd	cattle guard	Dd Ld	dead load	FO	fiber optic
ARV	air release valve	C To C	center to center	Defl	deflection	FD	field drive
Align	alignment	CL or $\varnothing$	centerline	Defm	deformed	F	fill
Al	alley	Ch	chain	DInt	delineate	FAA	fine aggregate angularity
Alt	alternate	Chnlk	chain-link	DIntr	delineator	FH	fire hydrant
Alum	aluminum	Ch Blk	channel block	Depr	depression	FI	flange
ADA	Americans with Disabilities Act	Ch Ch	channel change	Desc	description	Flrd	flared
&	and	Chk	check	Det	detail	FES	flared end section
Appr	approach	Chsld	chiseled	DWP	detectable warning panel	F Bcn	flashing beacon
Approx	approximate	Cir	circle	Dtr	detour	FA	flight auger sample
ACP	asbestos cement pipe	Cl	class	Dia or $\varnothing$	diameter	FL	flow line
Asph	asphalt	Clnt	clean-out	Dir	direction	Ftg	footing
AC	asphalt cement	Clr	clear	Dist	distance	FM	force main
Assmd	assumed	Cl&gr	clearing & grubbing	DM	disturbed material	Fnd	found
@	at	Comb.	combination	DB	ditch block	Fdn	foundation
Atten	attenuation	Coml	commercial	DG	ditch grade	Frac	fractional
ATR	automatic traffic recorder	Compr	compression	Dbl	double	Frwy	freeway
Ave	Avenue	CADD	computer aided drafting & design	Dn	down	Frt	front
Avg	average	Conc	concrete	Dwg	drawing	FF	front face
ADT	average daily traffic	CECB	concrete erosion control blanket	Dr	drive	F Disp	fuel dispenser
		Cond	conductor	Drwy	driveway	FFP	fuel filler pipes
		Const	construction	DI	drop inlet	FLS	fuel leak sensor
		Cont	continuous	D	dry density	Furn	furnish/ed
		CSB	continuous split barrel sample				
		Contr	contraction				
		Contr	contractor				
Bk	back	CP	control point	Ea	each		
BF	back face	Coord	coordinate	Esmt	easement		
Balc	balcony	Cor	corner	E	East		
B Wire	barbed wire	Corr	corrected	EB	Eastbound		
Barr	barricade	CAES	corrugated aluminum end section	Elast	elastomeric		
Btry	battery	CAP	corrugated aluminum pipe	EL	electric locker		
BI	beehive inlet	CMES	corrugated metal end section	E Mtr	electric meter		
Beg	begin	CMP	corrugated metal pipe	EVSE	electric vehicle supply equipment		
BG	below grade	CPVCP	corrugated poly-vinyl chloride pipe	Elec	electric/al		
BM	bench mark	CSES	corrugated steel end section	EDM	electronic distance meter		
Bkwy	bikeway	CSFES	corrugated steel flared end section	Elev or El	elevation		
Bit	bituminous	CSP	corrugated steel pipe	Ellipt	elliptical		
Blk	block	CSTES	corrugated steel traversable end section	Emb	embankment		
BH	bore hole	Co	County	Emuls	emulsion/emulsified		
Bot	bottom	Crse	course	ES	end section		
Blvd	Boulevard	Ct	Court	Engr	engineer		
Bndry	boundary	Xarm	cross arm	ESS	environmental sensor station		
Brkwy	breakaway	Xbuck	cross buck	Eq	equal		
Br	bridge	Xsec	cross sections	Evgr	evergreen		
Bldg	building	Xing	crossing	Exc	excavation		
Bus.	business	Xrd	crossroad	Exst	existing		
BV	butterfly valve	Crn	crown	Exp	expansion		
Byp	bypass			Expy	Expressway		
				E	external of curve		
				Extru	extruded		

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
04-23-18	General Revisions
09-20-18	General Revisions
12-18-20	General Revisions
08-16-22	General Revisions
04-14-25	General Revisions



NORTH DAKOTA	
DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
08-03-15	General Revisions
04-23-18	General Revisions
12-18-20	General Revisions
08-16-22	General Revisions
04-14-25	General Revisions



NDDOT ABBREVIATIONS

D-101-3

Salv	salvage(d)	Tel	telephone
San	sanitary sewer line	Tel B	Telephone Booth
Sec	section	Tel P	telephone pole
SL	section line	Tv	television
Sep	separation	Temp	temperature
Seq	sequence	Temp	temporary
Serv	service	TBM	temporary bench mark
Sht	sheet	T	thinwall tube sample
Shtng	sheeting	Ts	topsoil
Shldr	shoulder	Traf	traffic
Sw or Sdwk	sidewalk	TSCB	traffic signal control box
SD	sight distance	Tr	trail
SN	sign number	Transf	transformer
Sig	signal	Trans	transition
Sgl	single	TT	transmission tower
SRCP	slotted reinforced concrete pipe	TES	traversable end section
SC	slow curing	Trans	transverse
SS	slow setting	Trtd	treated
Sm	small	Trmt	treatment
S	South	Qc	triaxial compression
SE	Southeast	TERO	tribal employment rights ordinance
SW	Southwest	Tpl	triple
SB	Southbound	Typ	typical
Sp	spaces		
Spcl	special	Qu	unconfined compressive strength
SA	special assembly	Ugrnd	underground
SP	special provisions	Util	utility
G	specific gravity		
Spk	spike		
SB	split barrel sample	VG	valley gutter
SH	sprinkler head	Vap	vapor
SV	sprinkler valve	Vert	vertical
Sq	square	VCP	vitrified clay pipe
Stk	stake	Vol	volume
Std	standard	VSFS	vehicle speed feedback sign
N	standard penetration test		
Std Specs	standard specifications	Wkwy	walkway
Stm L	steam line	W	water content
SEC	steel encased concrete	WGV	water gate valve
SMA	stone matrix asphalt	WL	water line
SSD	stopping sight distance	WM	water main
SD	storm drain	WMV	water main valve
St	street	W Mtr	water meter
SPP	structural plate pipe	WSV	water service valve
SPPA	structural plate pipe arch	WW	water well
Str	structure	Wrng	wearing
Subd	subdivision	WIM	weigh in motion
Sub	subgrade	W	west
Sub Prep	subgrade preperation	WB	westbound
Ss	subsoil	Wrng	wiring
SS	supplement specification	W/	with
Supp	supplemental	W/o	without
Surf	surfacing		
Surv	survey		
Sym	symmetrical		

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
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REVISIONS	
DATE	CHANGE
09-03-15 04-23-18 12-18-20 08-16-22 04-14-25	General Revisions General Revisions General Revisions General Revisions General Revisions

NDDOT ABBREVIATIONS

D-101-4

MEASUREMENTS

ac	acres
A	ampere
Bd Ft	board feet
Cd	candela
cm	centimeter
C	coulomb
CF	cubic feet
m3	cubic meter
m3/s	cubic meters per second
CY	cubic yard
CY/mi	cubic yards per mile
D or Deg	degree
F	Fahrenheit
F	farad
ft	feet/foot
Gal	gallon
G	giga
Ha	hectare
H	henry
Hz	hertz
hr	hour(s)
in.	inch
J	joule
K	kelvin
kN	kilo newton
kPa	kilo pascal
kg	kilogram
kg/m3	kilogram per cubic meter
km	kilometer
K	Kip(s)
LF	linear foot
L	litre
Lm	lumen
L sum	lump sum
Lx	lux
M Hr	man hour
M	mega
m	meter
m/s	meters per second
mi	mile
mL	milliliter
mm	millimeter
mm/hr	millimeters per hour
n	nano
N	newton
Pa	pascal
lb	pounds
sec	seconds
S	siemens
SF	square feet
km2	square kilometer
m2	square meter
SY	square yard
Sta Yd	station yards
SI	Systems International

T	tesla
T/mi	tons per mile
V	volt
W	watt
Wb	weber

SURVEY DESCRIPTIONS

Az	azimuth
Bs	backsight
Brg	bearing
BP Cap	blue plastic cap
BS	both sides
BC	brass cap
CC	closing corner
CS	curve to spiral
Eq	equation
E	external of curve
FS	far side
FB	field book
Fs	foresight
Geod	geodetic
GIS	Geographical Information System
GPS	Global Positioning System
HI	height of instrument
IM	iron monument
I Pn	iron pin
LS	Land Surveyor (licensed)
LSIT	Land Surveyor In Training
L	length of curve
LC	long chord
LB	level book
MC	meander corner
Mer	meridian
M	mid ordinate of curve
NGS	National Geodetic Survey
NS	near side
Obsn	observation
Off Loc	office location
OP Cap	orange plastic cap
PK	Parker-Kalon nail
P Cap	plastic cap
PP Cap	pink plastic cap
PCC	point of compound curve
PC	point of curve
PI	point of intersection
PRC	point of reverse curvature
PT	point of tangent
POC	point on curve
POT	point on tangent
RTP	random traverse point
Rge	range
RP Cap	red plastic cap
SC	spiral to curve
SC	standard corner
ST	spiral to tangent
Sta	station
SE	superelevation
Tan	tangent
T	tangent (semi)
TS	tangent to spiral
Twp	township
TB	transit book
TP	traverse point
TP	turning point
USC&G	US Coast & Geodetic Survey
USGS	US Geologic Survey
VC	vertical curve
WC	witness corner
WGS	World Geodetic System
YP Cap	yellow plastic cap
Z	zenith

SOIL TYPES

Cl	clay
Cl F	clay fill
Cl Hvy	clay heavy
Cl Lm	clay loam
Co S	coal slack
C Gr	coarse gravel
CS	coarse sand
FS	fine sand
Gr	gravel
Lig Co	lignite coal
Lig Sl	lignite slack
Lm	loam
Rk	rock
Sd	sand
Sdy Cl	sandy clay
Sdy Cl Lm	sandy clay loam
Sdy Fl	sandy fill
Sdy Lm	sandy loam
Sc	scoria
Sh	shale
Si Cl	silt clay
Si Cl Lm	silty clay loam
Si Lm	silty loam

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07-01-14	
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12-18-20	Sheet Added
4-14-25	- Continued from D-101-3 General Revisions



NDDOT UTILITY COMPANY AND ORGANIZATION ABBREVIATIONS

D-101-10

702COM
ACCENT
AGASSIZ WU
AGC
ALL PL
ALL SEAS WU
AMOCO PI
AMRDA HESS
AT&T
B PAW
BAKER ELEC
BASIN ELEC
BEK TEL
BELLE PL
BLM
BNSF
BOEING
BRNS RWD
BURK-DIV ELEC
BURL WRD
CABLE ONE
CABLE SERV
CAP ELEC
CASS CO ELEC
CASS RWU
CAV ELEC
CBLCOM
CENEX PL
CENT PL WATER DIST
CENT PWR ELEC
CENTURYLINK
COE
CONS COMM
CONS TELCOM
CONT RES
CPR
D O E
DAK CARR
DAK CENT TEL
DAK RWD
DGC
DICKY R NET
DICKY WRD
DICKY TEL
DNRR
DOME PL
DVELEC
DVMW
E CENT REG WD
ENBRDG
ENVENTIS
EQUINOR
FALK MNG
FHWA
G FKS-TRL WD
GETTY TRD & TRAN
GLDN W ELEC

702 Communications
Accent Communications
Agassiz Water Users District
Associated General Contractors of America
Alliance Pipeline
All Seasons Water Users District
Amoco Pipeline Company
Amerada Hess Corporation
AT&T Corporation
Bear Paw Energy Incorporated
Baker Electric
Basin Electric Cooperative Incorporated
Bek Communications Cooperative
Belle Fourche Pipeline Company
Bureau of Land Management
Burlington Northern Santa Fe Railway
Boeing
Barnes Rural Water District
Burke-Divide Electric Cooperative
Burleigh County Water Resource District
Cable One
Cable Services
Capital Electric Cooperative Incorporated
Cass County Electric Cooperative
Cass Rural Water Users District
Cavalier Rural Electric Cooperative
Cablecom Of Fargo
Cenex Pipeline
Central Pipe Line Water District
Central Power Electric Cooperative
CenturyLink
Corps of Engineers
Consolidated Communications
Consolidated Telcom
Continental Resource Inc
Canadian Pacific Railway
Department Of Energy
Dakota Carrier Network
Dakota Central Telephone
Dakota Rural Water District
Dakota Gasification Company
Dickey Rural Networks
Dickey County Water Resource District
Dickey Telephone
Dakota Northern Railroad
Dome Pipeline Company
Dakota Valley Electric Cooperative
Dakota, Missouri Valley & Western
East Central Water District
Enbridge Pipelines Incorporated
Enventis Telephone
Equinor Pipeline
Falkirk Mining Company
Federal Highway Administration
Grand Forks-traill Water District
Getty Trading & Transportation
Golden West Electric Cooperative

GTR RAMSEY WD
GT PLNS NAT GAS
HALS TEL
IDEA1
INT-COMM TEL
KANEB PL
KEM ELEC
KOCH GATH SYS
LKHD PL
LWR YELL R ELEC
LUMEN
MCKNZ CON
MCKNZ ELEC
MCKNZ WRD
MCLEOD
MCLN ELEC
MCLN-SHRDN R WAT
MDU
MIDCO
MIDSTATE TEL
MINOT CABLE
MINOT TEL
MISS VALL COMM
MISS W W S
MNMOTA PWR
MOR-GRAN-SOU ELEC
MOUNT-WILLI ELEC
MLGC
MUNICIPAL
MUNICIPAL
N CENT ELEC
N PRAIR REG WD
ND PKS & REC
ND TEL
NDDOT
NE REG WD
NDSU SOIL SCI DEPT
NEMONT TEL
NODAK R ELEC
NOON FRMS TEL
NPR
NSP
NTHN BRDR PL
NTHN PLNS ELEC
NTHWSTRN REF
NW COMM
NWRWD
ONEOK
OSHA
OTTR TL PWR
PAAP
P L E M
POLAR COM
PVT ELEC
QWEST
R&T REG WD

Greater Ramsey Water District
Great Plains Natural Gas Company
Halstad Telephone Company
Idea1
Inter-Community Telephone Company
Kaneb Pipeline Company
Kem Electric Cooperative Incorporated
Koch Gathering Systems Incorporated
Lakehead Pipeline Company
Lower Yellowstone Rural Electric
Lumen Technologies Incorporated
McKenzie Consolidated Telcom
McKenzie Electric Cooperative
McKenzie County Water Resource District
McLeod USA
McLean Electric Cooperative
McLean-Sheridan Rural Water District
Montana-dakota Utilities
MidContinent Communications
Midstate Telephone Company
Minot Cable Television
Minot Telephone Company
Missouri Valley Communications Incorporated
Missouri West Water System
Minnkota Power
Mor-gran-sou Electric Cooperative
Mountrail-williams Electric Cooperative
Moore & Liberty - Griggs County
City Water And Sewer
City Of '.....'
North Central Electric Cooperative
North Prairie Regional Water District
North Dakota Parks And Recreation
North Dakota Telephone Company
North Dakota Department of Transportation
Northeast Regional Water District
NDSU Soil Science Department
Nemont Telephone
Nodak Rural Electric Cooperative
Noonan Farmers Telephone Company
Northern Plains Railroad
Northern States Power
Northern Border Pipeline
Northern Plains Electric Cooperative Incorporated
Northwestern Refinery Company
Northwest Communication Cooperation
Northwest Rural Water District
Oneok gas
Occupational Safety and Health Administration
Otter Tail Power Company
Plains All American Pipeline
Praieliands Energy Marketing
Polar Communications
Private Electric
Qwest Communications
R & T Water District

RED RIV COMM
RESVTN TEL
ROBRTS TEL
R-RIDER ELEC
RRVW
S CENT REG WD
SE W U
SCOTT CABLE
SHERDN ELEC
SHEYN VLY ELEC
SKYTECH
SLOPE ELEC
SOURIS RIV TELCOM
ST WAT COMM
STATE LN WATER
STER ENG
STUT RWD
SW PL PRJ
SWWA
SUNOCO
T M C
TCI
TESORO GHG PLNS PL
TRI-CNTY WU
TRL CO WRD
UNTD TEL
UPPR SOUR WD
US SPRINT
USAF MSL CABLE
USFWS
USW COMM
VRNDRY ELEC
W RIV TEL
WAPA
WAWSA
WEB
WILLI WRD
WILSTN BAS PL
WLSH RWD
WOLVRTN TEL
XLENER
YSVR

Red River Communications
Reservation Telephone
Roberts Company Telephone
Roughrider Electric Cooperative
Red River Valley & Western Railroad
South Central Regional Water District
Southeast Water Users Incorporated
Scott Cable Television Dickinson
Sheridan Electric Cooperative
Sheyenne Valley Electric Cooperative
Skyland Technologies Incorporated
Slope Electric Cooperative Incorporated
Souris River Telecommunications
State Water Commission
State Line Water Cooperative
Sterling Energy
Stutsman Rural Water District
Southwest Pipeline Project
Southwest Water Authority
Sunoco LP
Turtle Mountain Communications
TCI of North Dakota
Tesoro High Plains Pipeline
Tri-County Water Users Incorporated
Traill County Water Resource District
United Telephone
Upper Souris Water District
U.S. Sprint
U.S.A.F. Missile Cable
US Fish and Wildlife Service
U.S. West Communications
Verendrye Electric Cooperative
West River Telephone Incorporated
Western Area Power Administration
Western Area Water Supply Authority
W. E. B. Water Development Association
Williams County Water Resource District
Williston Basin Interstate Pipeline Company
Walsh Water Rural Water District
Wolverton Telephone
Xcel Energy
Yellowstone Valley Railroad

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
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DATE	CHANGE
04-23-18	General Revisions
09-20-18	General Revisions
12-18-20	General Revisions
08-16-22	General Revisions
04-14-25	General Revisions



LINE STYLES

D-101-20

Existing Topography

	Existing Ground Void
	Existing Cemetary Boundary
	Existing Box Culvert Bridge
	Existing Concrete Surface
	Existing Drainage Structure
	Existing Gravel Surface
	Existing Riprap
	Existing Dirt Surface
	Existing Asphalt Surface
	Existing Tie Point Line
	Existing Railroad Centerline
	Existing Guardrail Cable
	Existing Guardrail Metal
	Existing Edge of Water
	Existing Fence
	Existing Railroad
	Existing Field Line
	Exst Flow
	Existing Curb
	Existing Valley Gutter
	Existing Driveway Gutter
	Existing Curb and Gutter
	Existing Mountable Curb and Gutter

	Existing 3-Cable w Posts
	Site Boundary
	Existing Berm, Dike, Pit, or Earth Dam
	Existing Ditch Block
	Existing Tree Boundary
	Existing Brush or Shrub Boundary
	Existing Retaining Wall
	Existing Planter or Wall
	Existing W-Beam Guardrail with Posts
	Existing Railroad Switch
	Gravel Pit - Borrow Area
	Existing Wet Area-Vegetation Break
	Existing High Tension Cable Guardrail
	Existing High Tension Cable Guardrail with Posts

Proposed Topography

	3-Cable w Posts
	Flow
	Fence
	Remove Line
	Wall
	Retaining Wall (Plan View)
	W-Beam w Posts
	High Tension Cable Guardrail with Posts

Existing Utilities

	Existing Electrical
	Existing Fiber Optic Line
	Existing TV Fiber Optic
	Existing Gas Pipe
	Existing Overhead Utility Line
	Existing Power
	Existing Fuel Pipeline
	Existing Undefined Above Ground Pipe Line
	Existing Sanitary Sewer
	Existing Sanitary Force Main
	Existing Storm Drain
	Existing Storm Drain Force Main
	Existing Culvert
	Existing Telephone Line
	Existing TV Line
	Existing Water or Steam Line
	Existing Under Drain
	Existing Slotted Drain
	Existing Conduit
	Existing Conductor
	Existing Down Guy Wire Down Guy
	Existing Underground Vault or Lift Station

Proposed Utilities

	24 Inch Pipe
	Reinforced Concrete Pipe
	Under Drain
	Edge Drain

Traffic Utilities

	Conductor
	Fiber Optic
	Existing Loop Detector
	Existing Double Micro Loop Detector
	Micro Loop Detector Double
	Existing Micro Loop Detector
	Micro Loop Detector
	Signal Head with Mast Arm
	Existing Signal Head with Mast Arm

Sign Structures

	Existing Overhead Sign Structure
	Existing Overhead Sign Structure Cantilever
	Overhead Sign Structure Cantilever

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
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09-23-16	Added and Revised Items, Organized by Functional Groups
12-18-20	General Revisions

KIRK J. HOFF

REGISTERED

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PE-4683

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NORTH DAKOTA

12 18 2020

LINE STYLES

D-101-21

Right Of Way

	Easement
	Existing Easement
	Right of Way
	Existing Right of Way
	Existing Right of Way Railroad
	Existing Right of Way Not State Owned
	Existing Government Lot Line
	Existing Adjacent Block Lines
	Existing Adjacent Lot Lines
	Existing Adjacent Property Line
	Existing Adjacent Subdivision Lines
	Sight Distance Triangle Line
	Dimension Leader

Boundary Control

	Existing City Corporate Limits or Reservation Boundary
	Existing State or International Line
	Existing Township
	Existing County
	Existing Section Line
	Existing Quarter Section Line
	Existing Sixteenth Section Line
	Existing Centerline
	Tangent Line

Cross Sections and Typicals

	Existing Ground
	Existing Topsoil (Cross Section View)
	Existing Ground Void (Not Surveyed)
	Existing Concrete
	Existing Aggregate (Cross Section View)
	Existing Curb and Gutter (Cross Section View)
	Existing Asphalt (Cross Section View)
	Existing Reinforcement Rebar

Geotechnical

	Geotextile Fabric Type D
	Geogrid
	Geotextile Fabric Type R
	Geotextile Fabric Type R1
	Geotextile Fabric Type RR
	Geotextile Fabric Type S
	Subgrade Reinforcement
	Failure Line

Countours

	Depression Contours
	Supplemental Contour

Profile

	Subgrade, Subcut or Ditch Grade
	Topsoil Profile

Striping

	Centerline Pavement Marking
	Barrier with Centerline Pavement Marking
	Barrier Pavement Marking
	Stripe 4 IN Dotted Extension White
	Stripe 8 IN Dotted Extension White
	Stripe 8 IN Lane Drop

Pavement Joints

	Doweled Joint
	Tie Bar 30 Inch 4 Foot Center to Center
	Tie Bar 18 Inch 3 Foot Center to Center
	Tie Bar at Random Spacing

Bridge Details

	Small Hidden Object
	Large Hidden Object
	Phantom Object
	Existing Conditions Object
	Centerline Main
	Centerline Secondary
	Excavation Limits
	Proposed Ground
	Sheet Piling

Erosion Control

	Limits of Const Transition Line
	Bale Check
	Rock Check
	Floating Silt Curtain
	Silt Fence
	Excavation Limits
	Fiber Rolls

Environmental

	Wetland Mitigation
	Existing Wetland Easement USFWS
	Existing Wetland Jurisdictional
	Existing Wetland
	Tree Row

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

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SYMBOLS

D-101-30

	North Arrow (Half Scale)		Existing Bush or Shrub		Continuous Split Barrel Sample
	Alignment Data Point		Existing Large Evergreen Tree		Flight Auger Sample
	Alignment Monument		Existing Small Evergreen Tree		Split Barrel Sample
	Spot Elevation		Existing Large Tree		Thinwall Tube Sample
	Existing Miscellaneous Spot		Existing Small Tree		Standard Penetration Test
	Existing Access Control Arrow		Existing Tree Trunk		Inclinometer Tube
	Existing Benchmark		Cairn or Stone Circle		Excavation Unit
	Reset USGS Marker		Existing Artifact		Existing Ground Water Well Bore Hole
	Iron Monument Found		Existing Satellite Dish		
	Iron Pin R/W Monument		Existing Weather Station		
	Property Corner		Existing Windmill or Tower		
	Iron Pin Reference Monument		Reinforced Pavement		
	Right of Way Marker (Exst, Ppsd, Reset)				
	Existing Federal Reference Corner				
	Existing Section Corner (Full, Quarter, Sixteenth, Meander)				
	Existing Witness Corner				
	Existing Control Point (CP, GPS-RTK, TRI)				
	Existing Traverse PI Aerial Panel				
	Existing Reference Marker Point NGS				
	Existing EFB Misc				

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
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12-18-20	General Revisions

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12 18 2020

SYMBOLS

D-101-31

	Flexible Delineator		Highway Sign (Exst, Ppsd)
	Flexible Delineator Type A (Exst, Ppsd)		Mile Post Type A (Exst-Ppsd-Reset)
	Flexible Delineator Type B (Exst, Ppsd)		Mile Post Type B (Exst, Ppsd)
	Flexible Delineator Type C (Exst, Ppsd)		Mile Post Type C (Exst, Ppsd)
	Flexible Delineator Type D (Exst, Ppsd)		Object Marker Type I (Exst, Ppsd)
	Flexible Delineator Type E (Exst, Ppsd)		Object Marker Type II (Exst, Ppsd)
	Delineator Type A (Exst, Ppsd, Diamond Grade-Reset)		Object Marker Type III (Exst, Ppsd)
	Delineator Type B (Exst, Ppsd, Diamond Grade-Reset)		Existing Reference Marker
	Delineator Type C (Exst, Ppsd, Diamond Grade)		Road Closure Gate 18 Ft (Exst, Ppsd)
	Delineator Type D (Exst, Ppsd, Diamond Grade)		Road Closure Gate 28 Ft (Exst, Ppsd)
	Delineator Type E (Exst, Ppsd, Diamond Grade)		Road Closure Gate 40 Ft (Exst, Ppsd)
	Barricade (Type I, Type II, Type III)		Existing Railroad Battery Box
			Existing RR Profile Spot
			Existing Railroad Crossbuck
	Arrow Panel (Caution Mode, Double Direction, Left Directional, Right Directional, Sequencing, Truck Mounted)		Existing Railroad Frog
			Existing Mailbox (Private, Federal)
			
	Truck Mounted Attenuator		
	Delineator Drums		
	Flagger		
	Tubular Marker		
	Traffic Cone		
	Back to Back Vertical Panel Sign		

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
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SYMBOLS

D-101-32

	Existing Luminaire			High Mast Light Standard 3 Luminaire (Exst, Ppsd)		Existing Traffic Signal Standard			
	Luminaire LED			High Mast Light Standard 4 Luminaire (Exst, Ppsd)				Pull Box (Exst-Ppsd-Undefined)	
	Existing Light Standard Luminaire			High Mast Light Standard 5 Luminaire (Exst, Ppsd)				Intelligent Transportation Pull Box (Exst, Ppsd)	
	Relocate Light Standard			High Mast Light Standard 6 Luminaire (Exst, Ppsd)				Transformer (Exst, Ppsd)	
	Light Standard Light LED Luminaire			High Mast Light Standard 7 Luminaire (Exst, Ppsd)				Power Pole (Exst-Ppsd-with Transformer)	
	Light Standard 35 Watt High Pressure Sodium Vapor Luminaire			High Mast Light Standard 8 Luminaire (Exst, Ppsd)				Wood Pole (Exst, Ppsd)	
	Light Standard 50 Watt High Pressure Sodium Vapor Luminaire			High Mast Light Standard 9 Luminaire (Exst, Ppsd)				Pedestrian Push Button Post (Exst, Ppsd)	
	Light Standard 70 Watt High Pressure Sodium Vapor Luminaire			High Mast Light Standard 10 Luminaire (Exst, Ppsd)				Existing Pole	
	Light Standard 100 Watt High Pressure Sodium Vapor Luminaire			Overhead Sign Structure Load Center (Exst, Ppsd)				Existing Telephone Pole	
	Light Standard 150 Watt High Pressure Sodium Vapor Luminaire			Traffic Signal Controller (Exst, Ppsd)				Existing Post	
	Light Standard 200 Watt High Pressure Sodium Vapor Luminaire			Pad Mounted Traffic Signal Controller (Exst, Ppsd)					Connection Conductor (Ground, Neutral, Phase 1, Phase 2)
	Light Standard 250 Watt High Pressure Sodium Vapor Luminaire			Flashing Beacon (Exst, Ppsd)					
	Light Standard 310 Watt High Pressure Sodium Vapor Luminaire			Concrete Foundation (Exst, Ppsd)					
	Light Standard 400 Watt High Pressure Sodium Vapor Luminaire			Pipe Mounted Flasher (Exst, Ppsd)					
	Light Standard 700 Watt High Pressure Sodium Vapor Luminaire			Pad Mounted Feed Point (Exst, Ppsd)					
	Light Standard 1000 Watt High Pressure Sodium Vapor Luminaire			Pipe Mounted Feed Point with Pad (Exst, Ppsd)					
	Emergency Vehicle Detector			Pole Mounted Feed Point (Exst, Ppsd)					
	Video Detection Camera			Junction Box (Exst, Ppsd)					
				Existing Pedestrian Head with Number					
				Existing Signal Head					
				Pole Mounted Head					
				Existing Lighting Standard Pole					

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
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12-18-20	General Revisions

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07-01-14 REVISIONS	
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SYMBOLS

D-101-33

			Existing Manhole (Electrical, Gas, Telephone)		Cap or Stub Exst Gas, Exst Sanitary, Exst Storm Drain, Ppsd Storm Drain, Exst Water
			Water Manhole (Exst, Exst with Valve)		Existing Pedestal Electrical, Telephone, Fiber Optic Telephone, TV, Fiber Optic TV, Undefined
			Sanitary Sewer Manhole (Exst, Ppsd, Exst with Valve)		Existing Pipe Vent Gas, Fuel, Sanitary, Storm Drain, Water, Undefined
			Sanitary Force Main Manhole (Exst, Ppsd, Exst with Valve)		Valve Exst Gas, Exst Water, Ppsd Water, Exst Undefined
			Storm Drain Manhole (Exst, Ppsd, Exst with Inlet, Ppsd with Inlet)		Pump Sanitary, Storm Drain, Exst Water
			Force Main Storm Drain Manhole (Exst, Exst with Valve)		Corrugated Metal End Section (18, 24, 30, 36, 42, 48, 54, 60 Inch)
			Manhole (Ppsd, Ppsd 48 Inch, Exst Undefined)		Reinforced Concrete End Section (18, 24, 30, 36, 42, 48, 54, 60 Inch)
			Existing Water Appurtenance		Existing Utility Marker
			Sprinkler Head (Exst, Ppsd)		Existing Meter
			Fire Hydrant (Exst, Ppsd)		Existing Fuel Dispensers
			Cleanout (Exst Sanitary, Underdrain)		Existing Fuel Filler Pipes
			Existing Catch Basin Inlet (Round, Square)		Existing Fuel Leak Sensors
			Existing Curb Inlet (Round, Square)		
			Existing Slotted Reinforced Concrete Pipe		
			Catch Basin (Riser 30 Inch, Beehive, Type A)		
			Inlet Mountable Curb (Type A, Type B)		
			Inlet Saddle Base (Type 1, Type 2)		
			Inlet Special (Catch Basin, Type 1, Type A)		
			Inlet (Tee, Type 1, Type 2, Type 2 Double)		
			Median Drain		
			Headwall (Exst, Ppsd, Ppsd Single with Vegetation Barrier, Ppsd Double with Vegetation Barrier)		

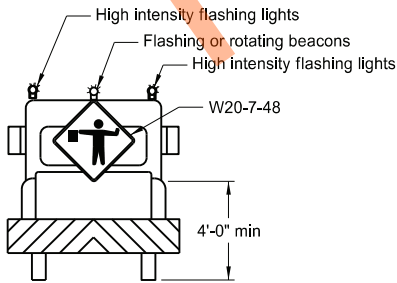
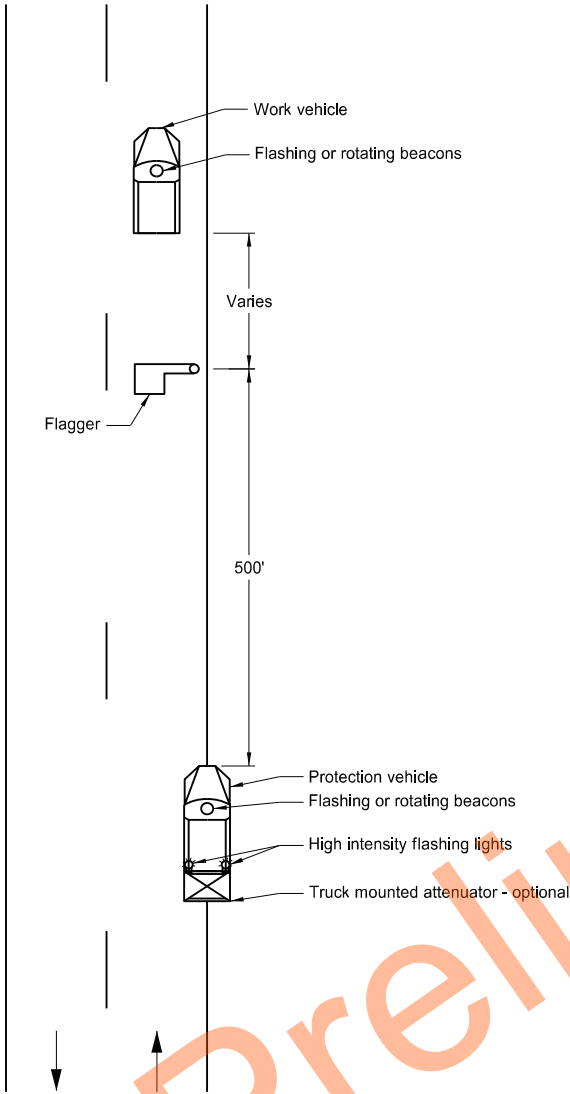
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
12-18-20	General Revisions Sheet added - Continued from D-101-32

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NORTH DAKOTA
12 18 2020

TRAFFIC CONTROL FOR CORING OF HOT BITUMINOUS PAVEMENT

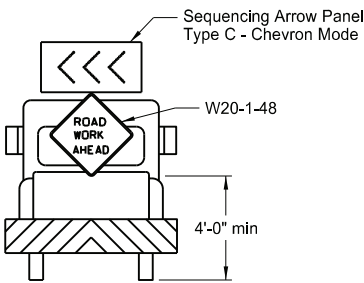
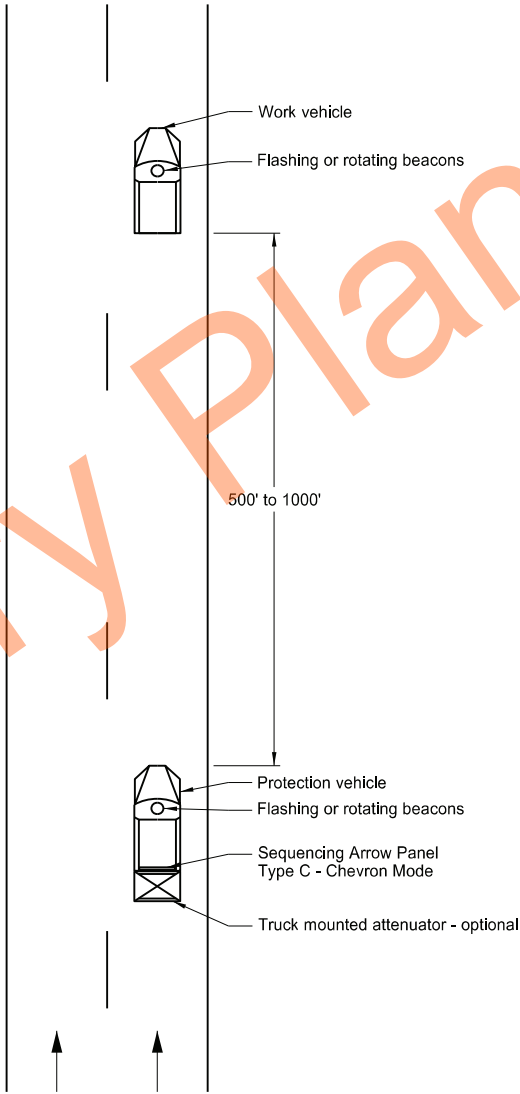
D-704-2

Two Lane, Two Way Roadways



Typical Protection Vehicle

Multilane Roadways



Typical Protection Vehicle

- Notes:
1. Display a 360 degree rotating, flashing, oscillating or strobe light on the working vehicle.
 2. Display a 360 degree rotating, flashing, oscillating or strobe light on the shadow vehicle. Operate a sequencing arrow panel Type C in chevron mode on the shadow vehicle for Multilane Roadway.
 3. Use these layouts during daylight hours and in areas of good visibility only.
 4. Use flagger to protect the work area and warn oncoming traffic for two lane, two way roadway.

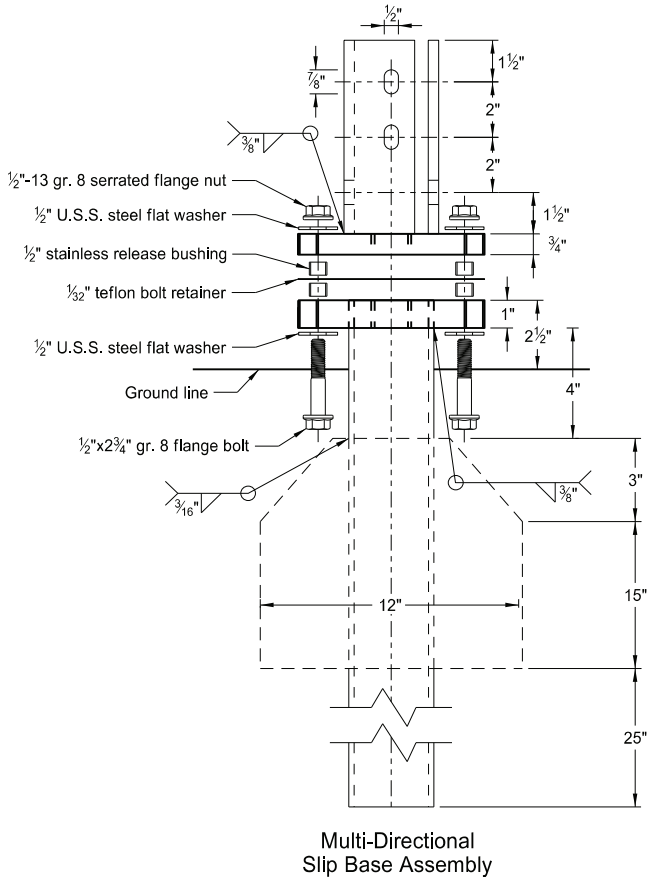
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-25-12	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
10-03-19	New Design Engr PE Stamp
8-01-24	Electronic Stamp/Signature



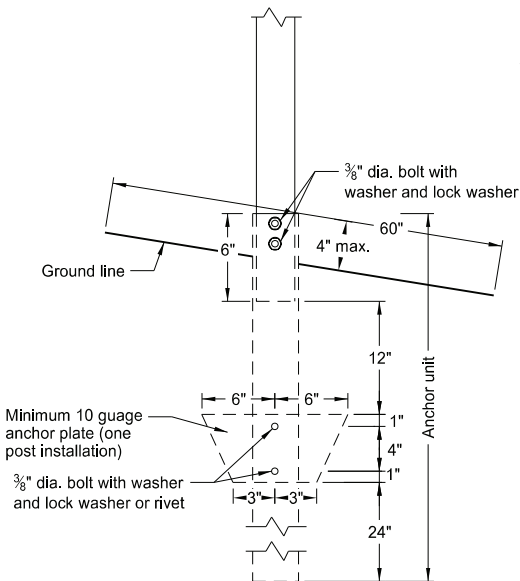
08/01/24

BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

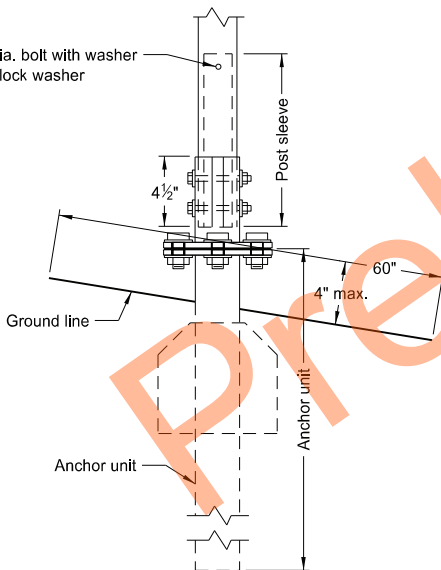
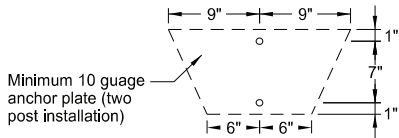
D-704-7



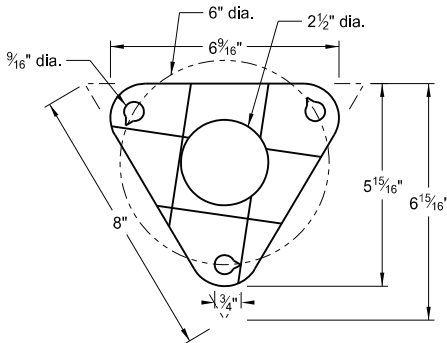
Multi-Directional Slip Base Assembly



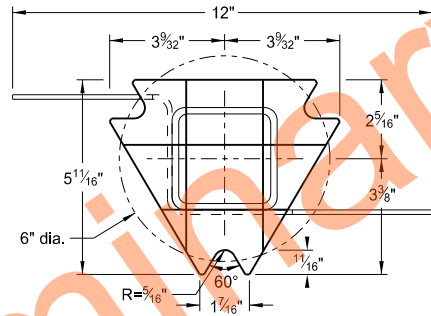
Anchor Unit and Post Assembly



Multi-Directional Slip Base Anchor Unit and Post Sleeve Assembly



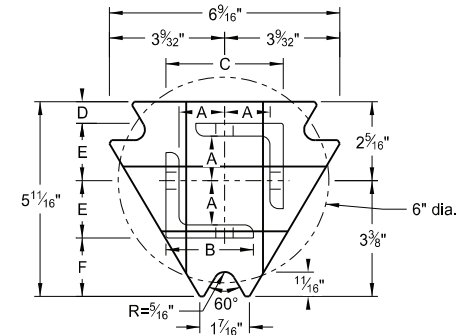
Bolt Retainer for Base Connection
Bolt Retainer- 1/32" Reprocessed Teflon



Bottom Soil Stub

Tube - 3"x3"x7 gauge ASTM A500 grade B tube
Stabilizing Wing - 7 gauge H.R.P.O. ASTM A1011
Plate - ASTM A572 grade 50

Perforated Tube



Top Post Receiver

Plate - ASTM A572 grade 50
Angle Receiver - 2 1/2"x2 1/2"x3/8" ASTM A36 structural angle

Telescoping Perforated Tube						
Number of Posts	Post Size in.	Wall Thickness Gauge	Sleeve Size in.	Wall Thickness Gauge	Slip Base	Anchor Size without Slip Base in.
1	2	12			No	2 1/4
1	2 1/4	12			No	2 1/2
1	2 1/2	12			(A)	3
1	2 1/2	10			Yes	
1	2 1/4	12	2	12	Yes	
1	2 1/2	12	2 1/4	12	Yes	
2	2	12			No	2 1/4
2	2 1/4	12			No	2 1/2
2	2 1/2	12			Yes	
2	2 1/2	12			Yes	
2	2 1/4	10	2	12	Yes	
2	2 1/2	12	2 1/4	12	Yes	
3 & 4	2 1/2	12			Yes	
3 & 4	2 1/2	10			Yes	
3 & 4	2 1/2	12	2 1/4	12	Yes	
3 & 4	2 1/4	12	2	12	Yes	
3 & 4	2 1/2	10	2 3/16	10	Yes	

(A) Use breakaway base when support is placed in weak soils. Engineer determines if soils are weak.

(B) For additional wind load, insert the 2 3/16"x10 ga. into 2 1/2"x10 ga.

Notes:

1. Torque slip base bolts as specified by manufacturer.
2. Use anchor with 43.9 KSI yield strength and 59.3 KSI tensile strength.
3. Provide 4" vertical clearance for anchor or breakaway base. Measure the 4"x60" measurement above and below post location and back and ahead of post.
4. In concrete sidewalk, use same anchor without wings.
5. Provide more than 7' between the first and fourth posts of a four post sign.

Properties of Telescoping Perforated Tube						
Tube Size in.	Wall Thickness in.	U.S. Standard Gauge	Weight per Foot lbs.	Moment of Inertia in. ⁴	Cross Sec. Area in. ²	Section Modulus in. ³
1 1/2 x 1 1/2	0.105	12	1.702	0.129	0.380	0.172
2 x 2	0.105	12	2.416	0.372	0.590	0.372
2 1/4 x 2 1/4	0.105	12	2.773	0.561	0.695	0.499
2 3/16 x 2 3/16	0.135	10	3.432	0.605	0.841	0.590
2 1/2 x 2 1/2	0.105	12	3.141	0.804	0.803	0.643
2 1/2 x 2 1/2	0.135	10	4.006	0.979	1.010	0.785

Top Post Receiver Data Table						
Square Post Sizes (B)	A	B	C	D	E	F
2 3/16"x10 ga.	1 5/16"	2 1/2"	3 1/32"	2 5/32"	1 33/64"	1 7/8"
2 1/2"x10 ga.	1 3/32"	2 1/2"	3 5/16"	5/8"	1 21/32"	1 3/4"

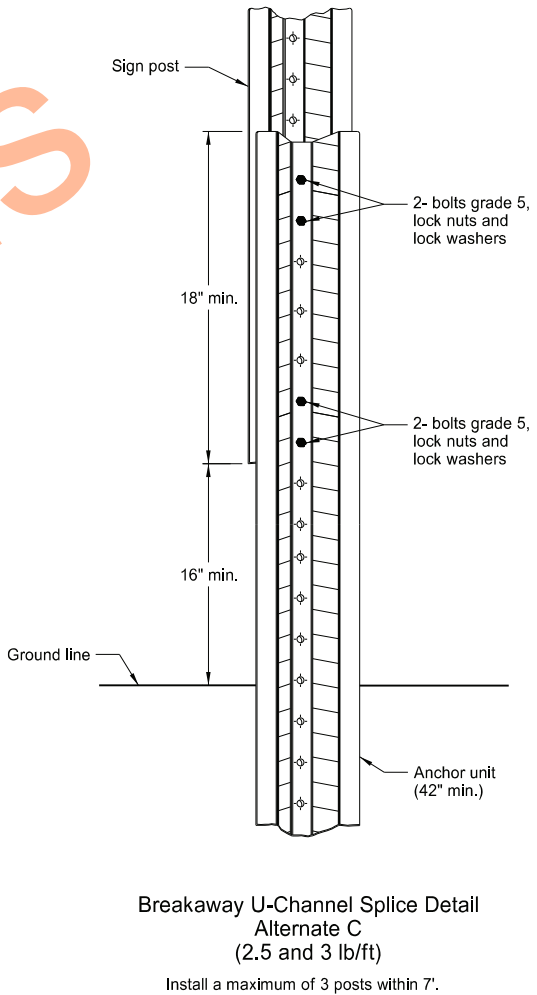
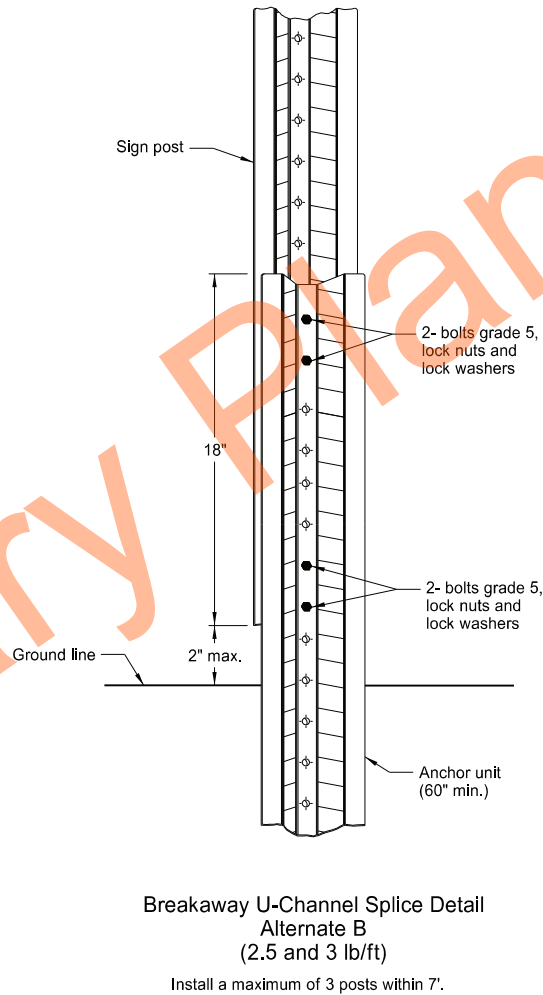
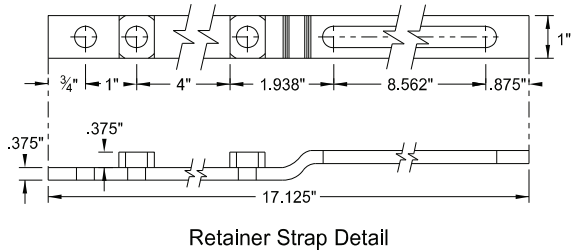
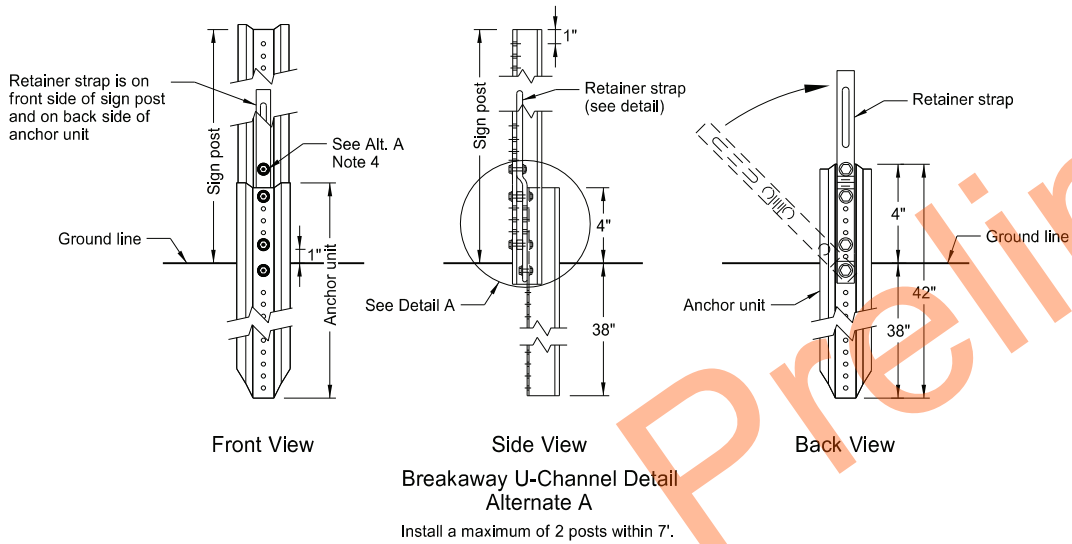
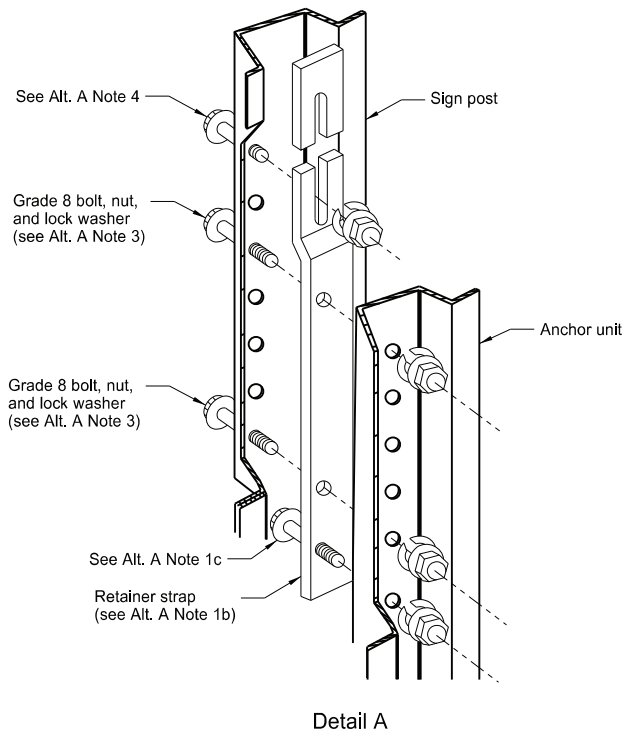
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-28-14	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
10-03-19	New Design Engr PE Stamp
8-01-24	Electronic Stamp/Signature



BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-8

U-Channel Post



Alternate A Steps of Installation:

- Drive anchor unit to within 12" of ground level.
 - Establish proper assembly by lining up bottom hole of retainer strap with 6th hole from the top of the anchor unit.
 - Assemble strap to back of anchor unit using 5/16"x2" bolt, lock washer and nut.
 - Rotate strap 90° to left.
- Drive anchor unit to 4" above ground.
 - Rotate strap to vertical position.
- Place 5/16"x2" bolt, lock washer and nut in bottom of sign post to facilitate alignment of sign post with proper hole in anchor unit.
 - Alternately tighten two connector bolts.
- Complete assembly by tightening 5/16"x2" bolt (this fastens sign post to retainer strap).
- Properly nest base post, strap, and sign post. Proper nesting occurs when all flat surfaces of the base post, strap, and sign post at the bolts have full contact across the entire width.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
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REVISIONS	
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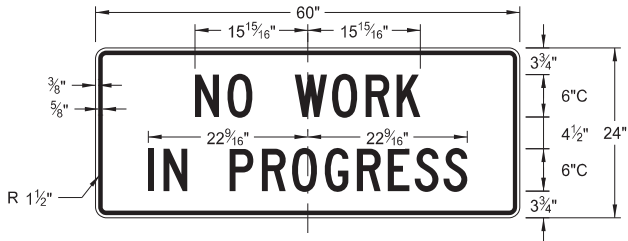


08/01/24

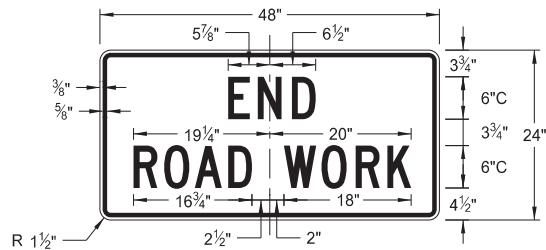
CONSTRUCTION SIGN DETAILS
TERMINAL AND GUIDE SIGNS



G20-1-60
Legend: black (non-refl)
Background: orange



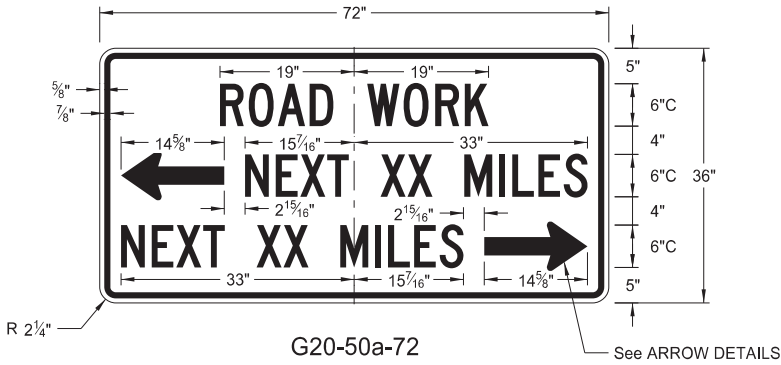
G20-1b-60
Legend: black (non-refl)
Background: orange



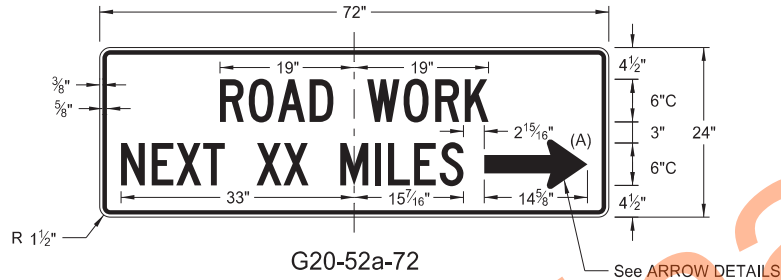
G20-2-48
Legend: black (non-refl)
Background: orange



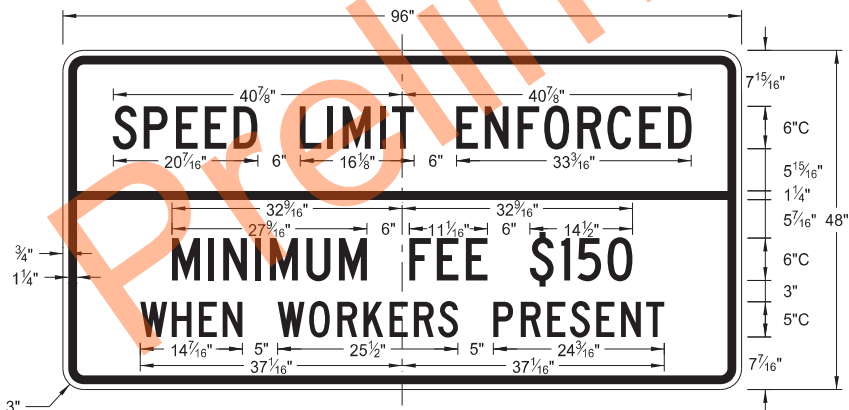
G20-4b-36
Legend: black (non-refl)
Background: orange



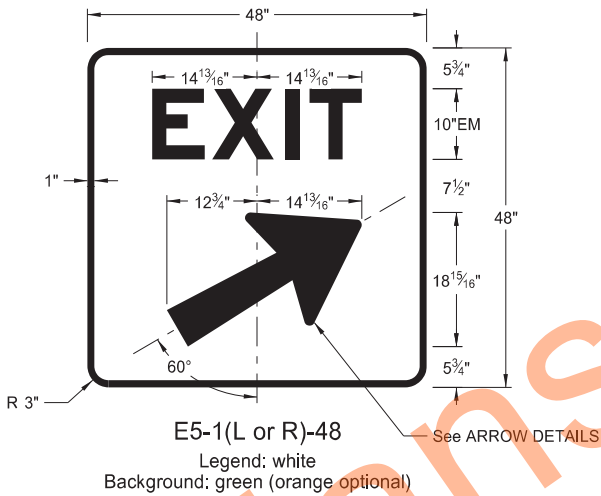
G20-50a-72
Legend: black (non-refl)
Background: orange



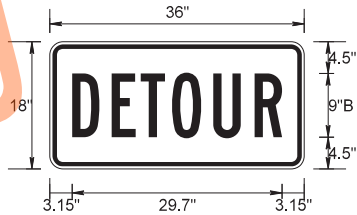
G20-52a-72
Legend: black (non-refl)
Background: orange



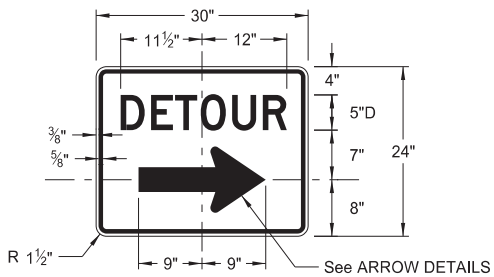
G20-55-96
Legend: black (non-refl)
Background: orange



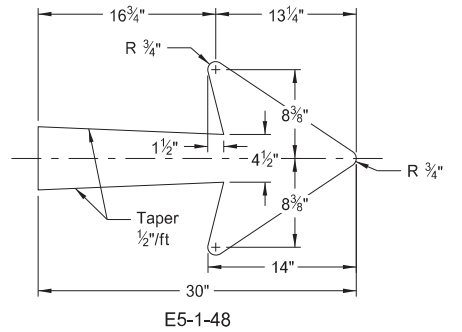
E5-1(L or R)-48
Legend: white
Background: green (orange optional)



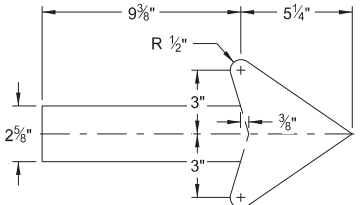
M4-8-36
Legend: black (non-refl)
Background: orange



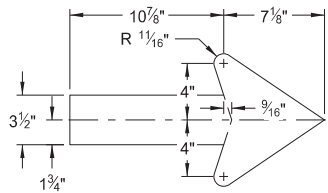
M4-9(L or R)-30 &
M4-9-30
Legend: black (non-refl)
Background: orange



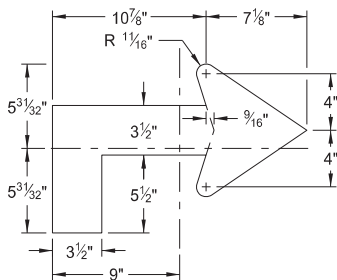
E5-1-48



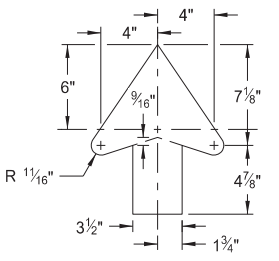
G20-50a-72
G20-52a-72



M4-9(L or R)-30
Right or Left



M4-9(L or R)-30
Advanced Right or Left



M4-9-30
Straight

ARROW DETAILS

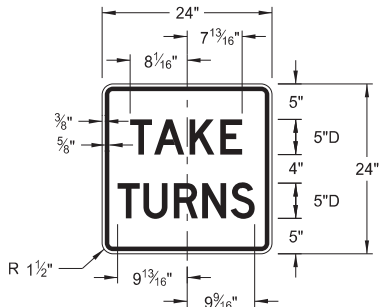
NOTES:

(A) Arrow may be right or left of the legend to indicate construction to the right or left.

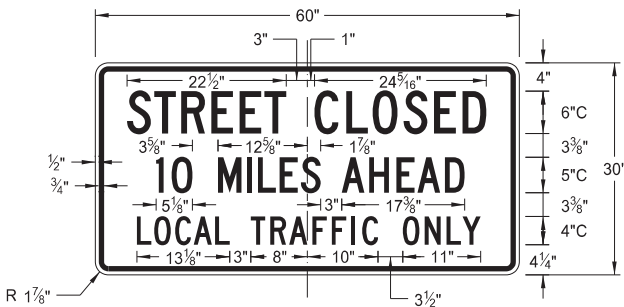
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
08-17-17	Added sign & background color
10-03-19	New Design Engineer PE Stamp
08-01-24	Electronic Stamp/Signature
06-30-25	Legislative Changes



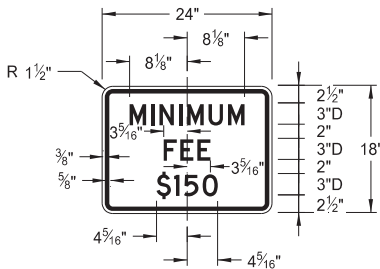
CONSTRUCTION SIGN DETAILS
REGULATORY SIGNS



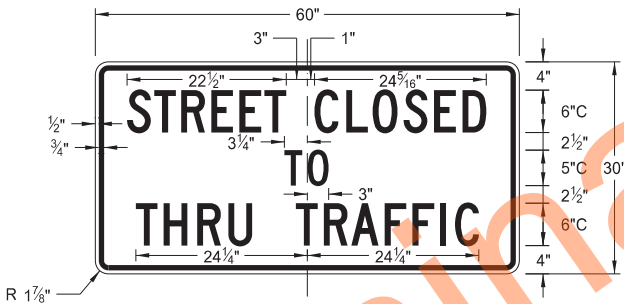
R1-50P-24
Legend: black (non-refl)
Background: white



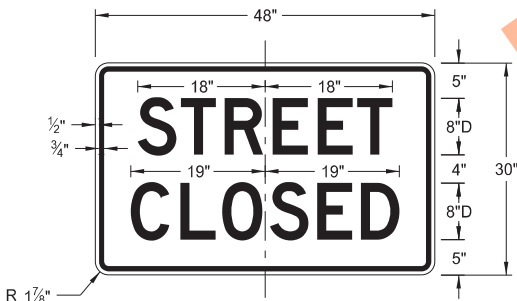
R11-3c-60
Legend: black (non-refl)
Background: white



R2-1aP-24
Legend: black (non-refl)
Background: white



R11-4a-60
Legend: black (non-refl)
Background: white



R11-2a-48
Legend: black (non-refl)
Background: white

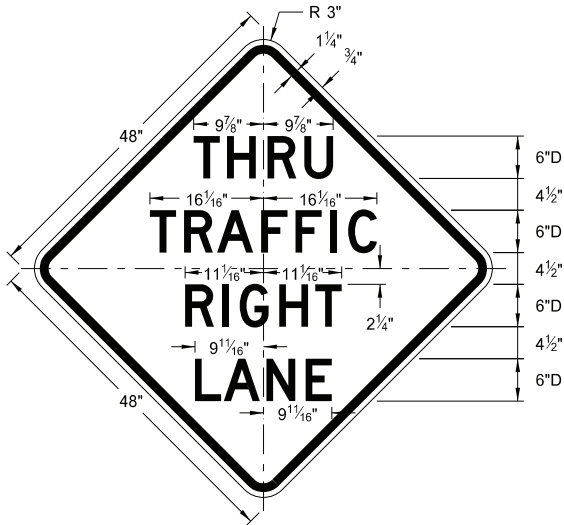
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
08-17-17	Revised sign number
10-03-19	New Design Engineer PE Stamp
08-01-24	Electronic Stamp/Signature
06-30-25	Legislative Changes



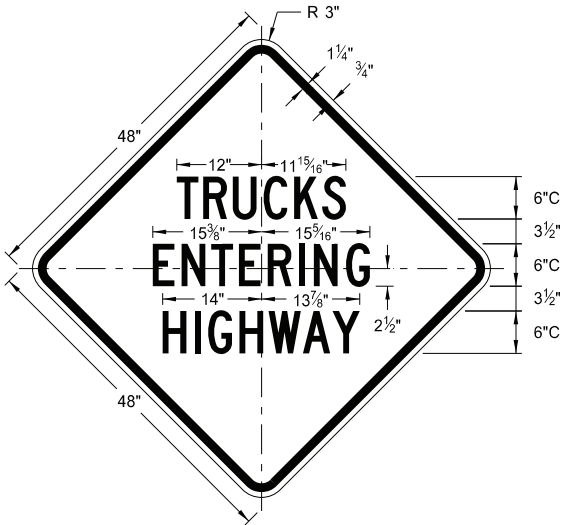
CONSTRUCTION SIGN DETAILS
WARNING SIGNS

WORD	LETTER SPACING
AHEAD	Standard
200 FT	Standard
350 FT	Standard
500 FT	Standard
1000 FT	Reduce 40%
1500 FT	Reduce 40%
½ MILE	Reduce 50%
1 MILE	Standard

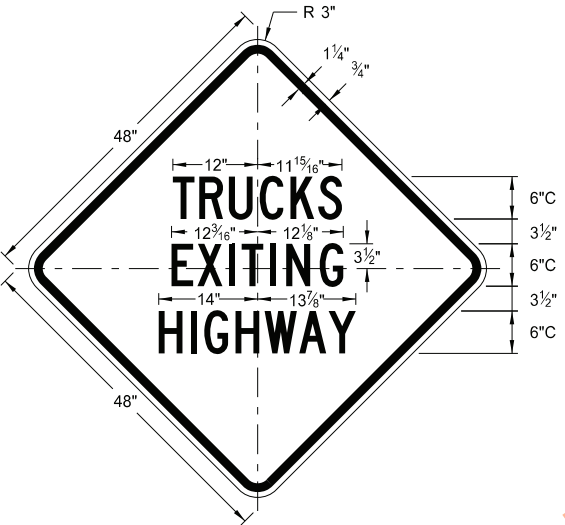
* DISTANCE MESSAGES



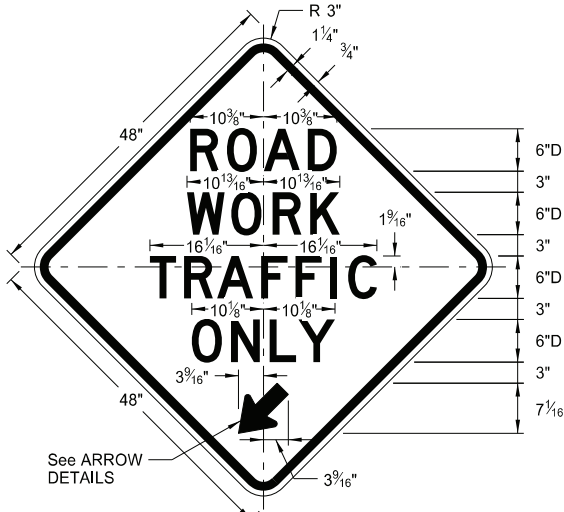
W5-8-48
Legend: black (non-refl)
Background: orange



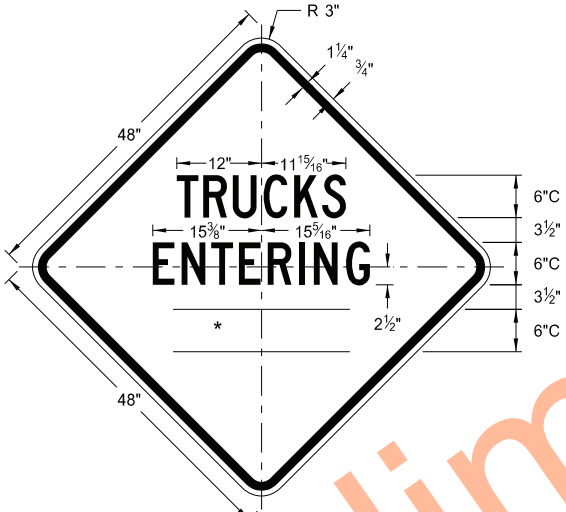
W8-53-48
Legend: black (non-refl)
Background: orange



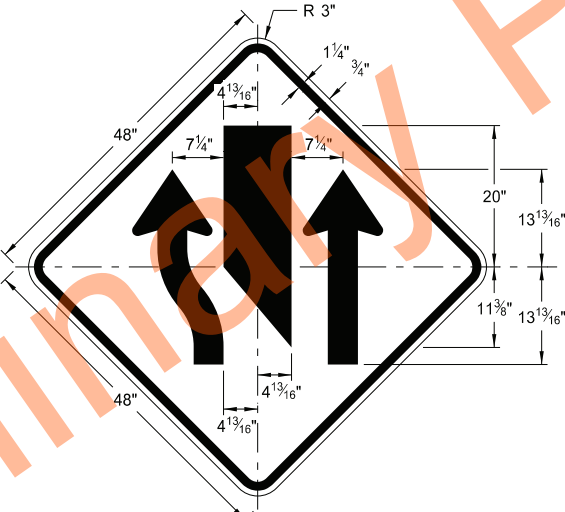
W8-56-48
Legend: black (non-refl)
Background: orange



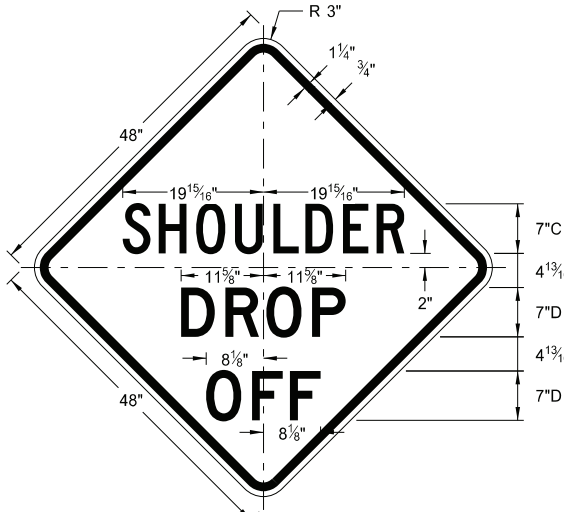
W5-9-48
Legend: black (non-refl)
Background: orange



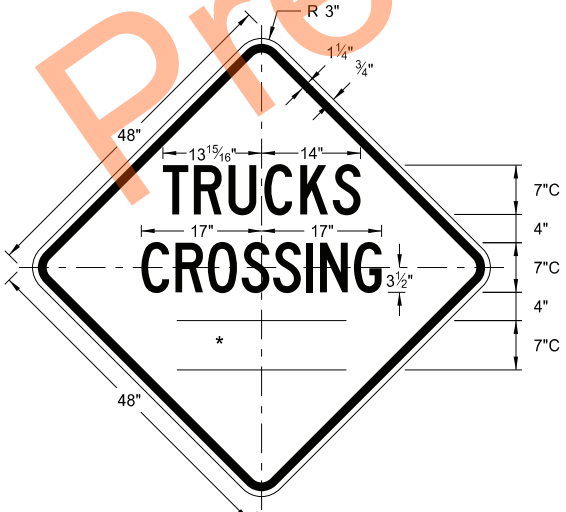
W8-54-48
Legend: black (non-refl)
Background: orange



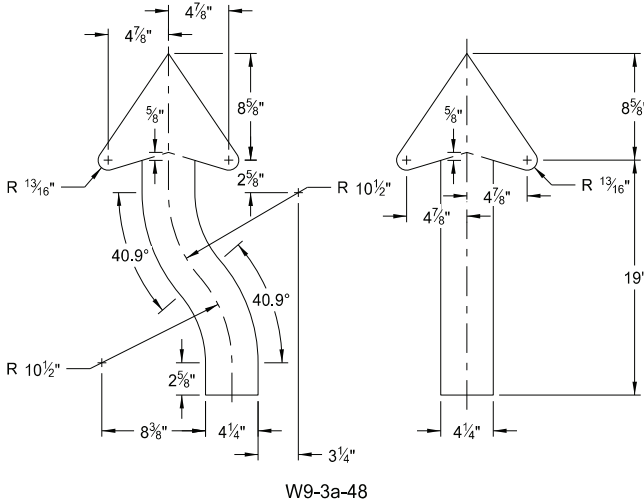
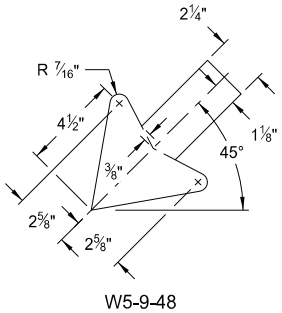
W9-3a-48
Legend: black (non-refl)
Background: orange



W8-9a-48
Legend: black (non-refl)
Background: orange



W8-55-48
Legend: black (non-refl)
Background: orange



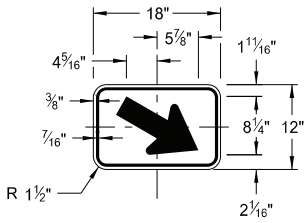
ARROW DETAILS

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
8-17-17	Updated sign number
5-31-18	Revised sign and arrow details
10-03-19	New Design Engineer PE Stamp
8-01-24	Electronic Stamp/Signature

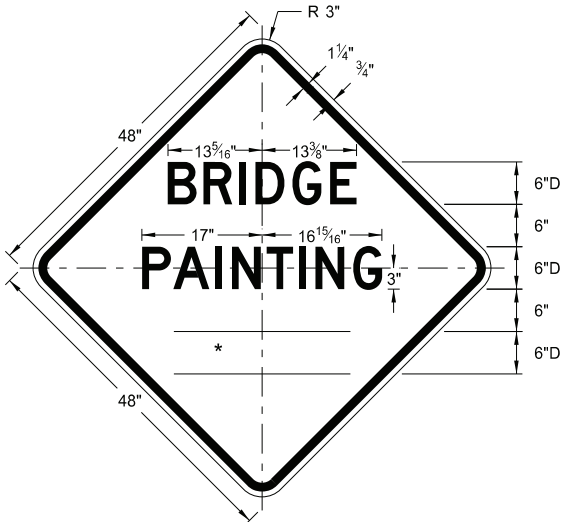


08/01/24

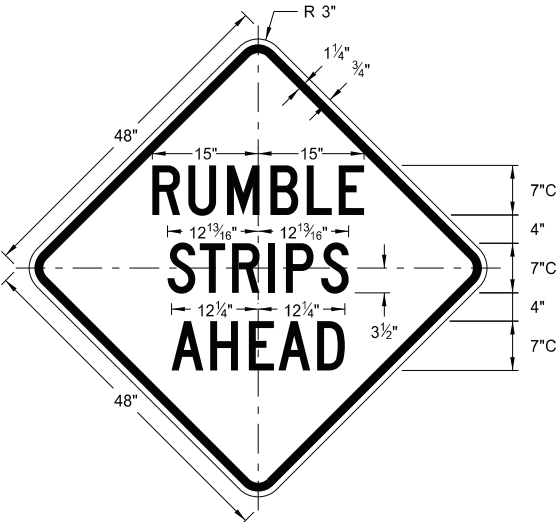
CONSTRUCTION SIGN DETAILS
WARNING SIGNS



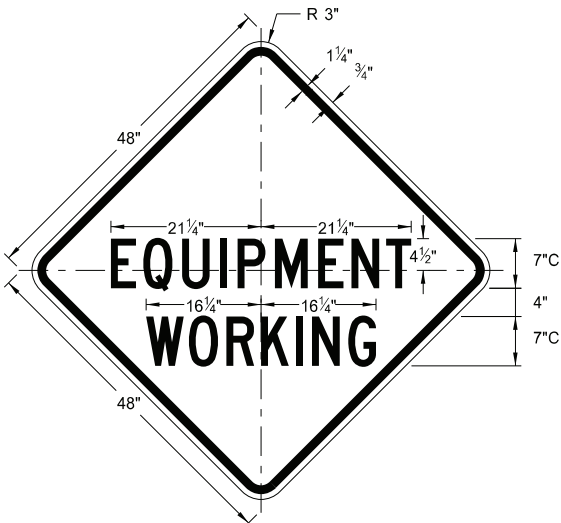
W16-7aP-18
Legend: black (non-refl)
Background: orange



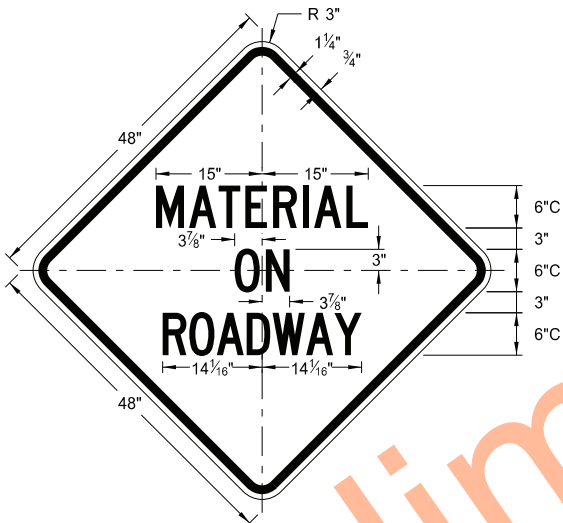
W21-50-48
Legend: black (non-refl)
Background: orange



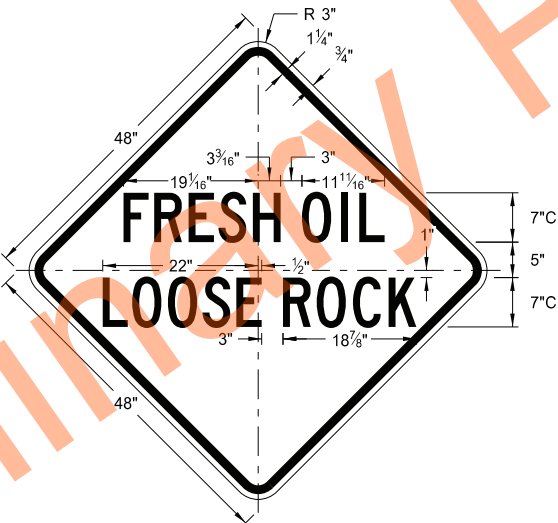
W21-53-48
Legend: black (non-refl)
Background: orange



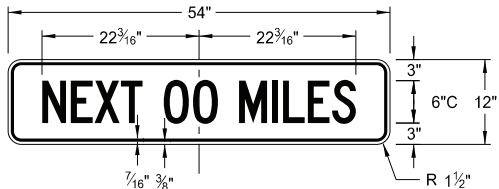
W20-51-48
Legend: black (non-refl)
Background: orange



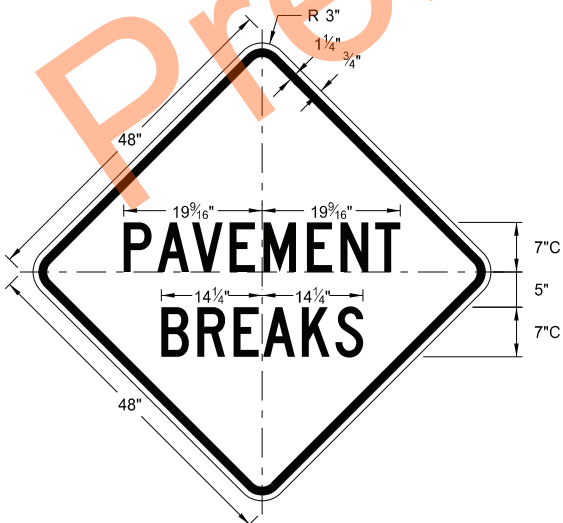
W21-51-48
Legend: black (non-refl)
Background: orange



W22-8-48
Legend: black (non-refl)
Background: orange



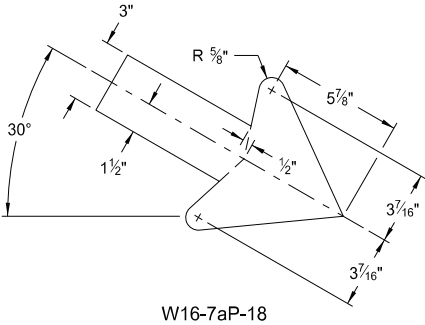
W20-52P-54
Legend: black (non-refl)
Background: orange



W21-52-48
Legend: black (non-refl)
Background: orange

WORD	LETTER SPACING
AHEAD	Standard
200 FT	Standard
350 FT	Standard
500 FT	Standard
1000 FT	Reduce 40%
1500 FT	Reduce 40%
½ MILE	Reduce 50%
1 MILE	Standard

* DISTANCE MESSAGES



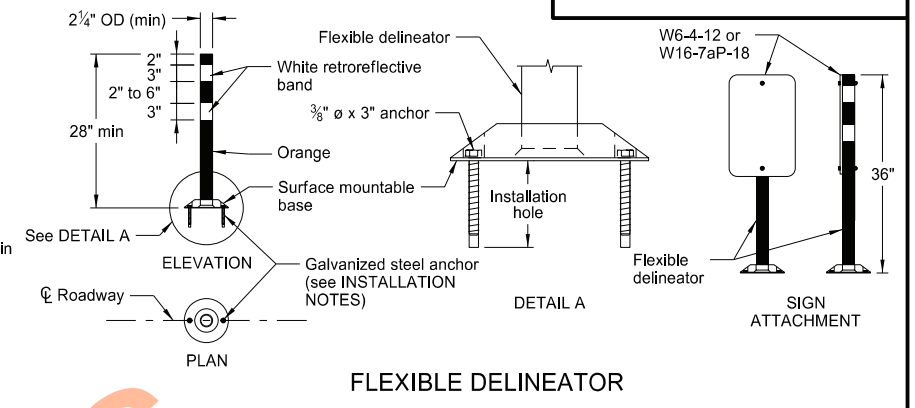
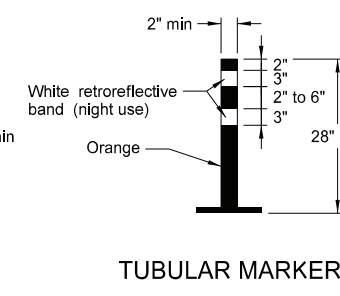
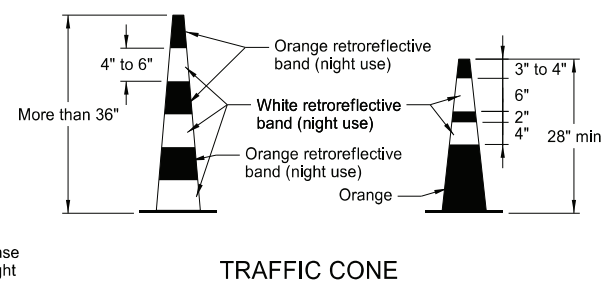
W16-7aP-18

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
5-31-18	
REVISIONS	
DATE	CHANGE
11-01-19	Added details for sign W16-7aP-18.
8-01-24	Electronic Stamp/Signature.



08/01/24

D-704-13

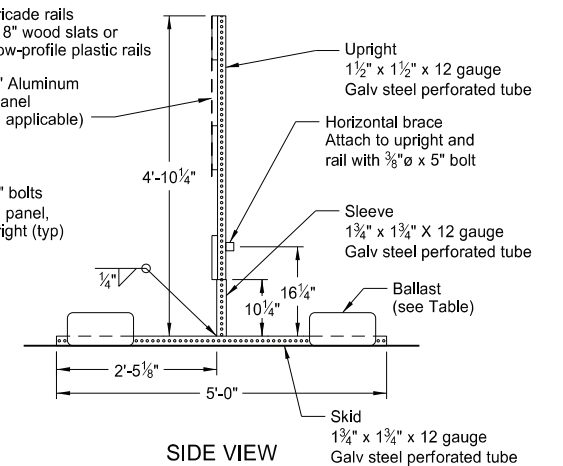
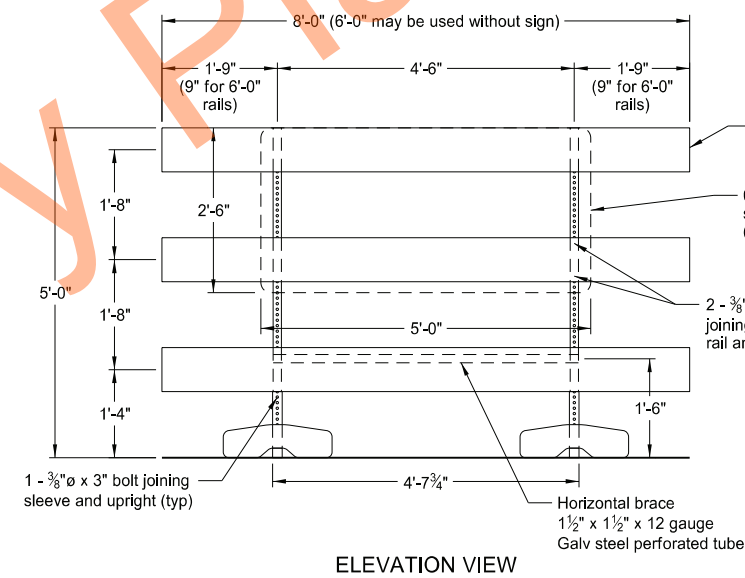
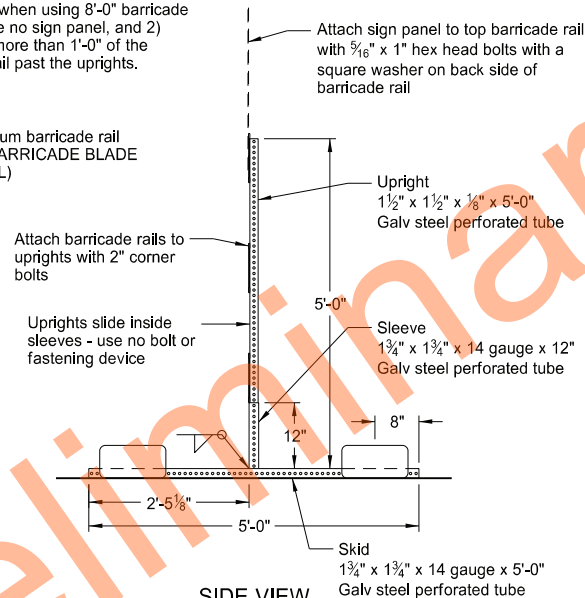


Provide alternating orange and white retroreflective stripes, sloping downward in direction vehicular traffic is to pass. Place retroreflective sheeting on both sides of panel with a minimum of 270 square inches of retroreflective area facing vehicular traffic. Where the height of the retroreflective material on the vertical panel is 36 inches or more, use a stripe width of 6 inches.

Provide retroreflectorization of cones more than 36" in height by alternating orange and white retroreflective stripes. Use a minimum of two orange and two white stripes for each cone with the top stripe being orange. Use maximum 3" nonretroreflectorized space between the orange and white stripes.

Provide retroreflectorization of tubular markers more than 42" in height by alternating four 4" to 6" wide orange and white stripes with the top stripe being orange.

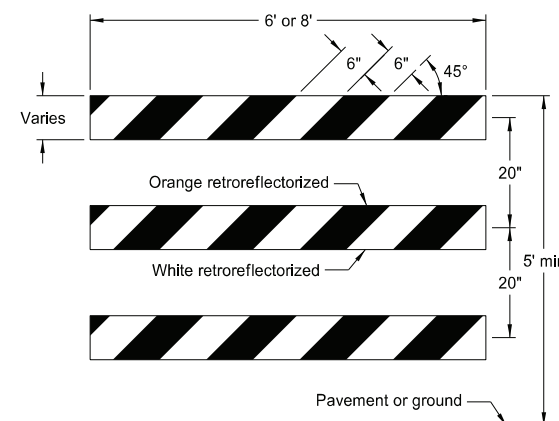
- ### INSTALLATION NOTES:
1. Drill installation holes to diameter and depth required by manufacturer's specifications.
 2. For removal, remove anchors and fill installation hole with an epoxy designed to bond to pavement surface.
 3. In lieu of bolted down base, use an 8" x 8" butyl pad or hot melt butyl. Remove butyl as close as possible to pavement surface.



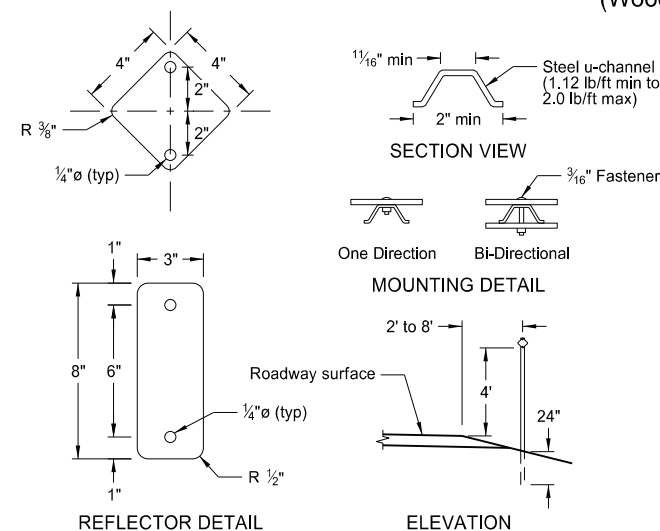
BARRICADE ASSEMBLY DETAIL (Aluminum Barricade Rails)

Diagram illustrating the standard longitudinal profile of a traffic warning line. The diagram shows a cross-section of a road with a warning line. The line is 8 inches high and 6 to 10 feet long. It consists of alternating black and white segments. The black segments are 6 inches wide and the white segments are 6 inches wide. The segments are oriented at a 45-degree angle. The diagram is labeled with dimensions and materials: 8", 6' to 10', 45°, 6", 6", 3'-0" to, Orange retroreflectized, White retroreflectized, and Pavement or ground.

BARRICADE RAIL DETAILS



TYPE III BARRICADE



DELINEATORS

MINIMUM BALLAST (For each side of barricade support)	
Without Sign	4 - 25 lb sandbags
With Sign	6 - 25 lb sandbags

Note: Number of sandbags based on a wind speed of 55 MPH. Sandbags assumed to be placed at or near the ends of the skids.

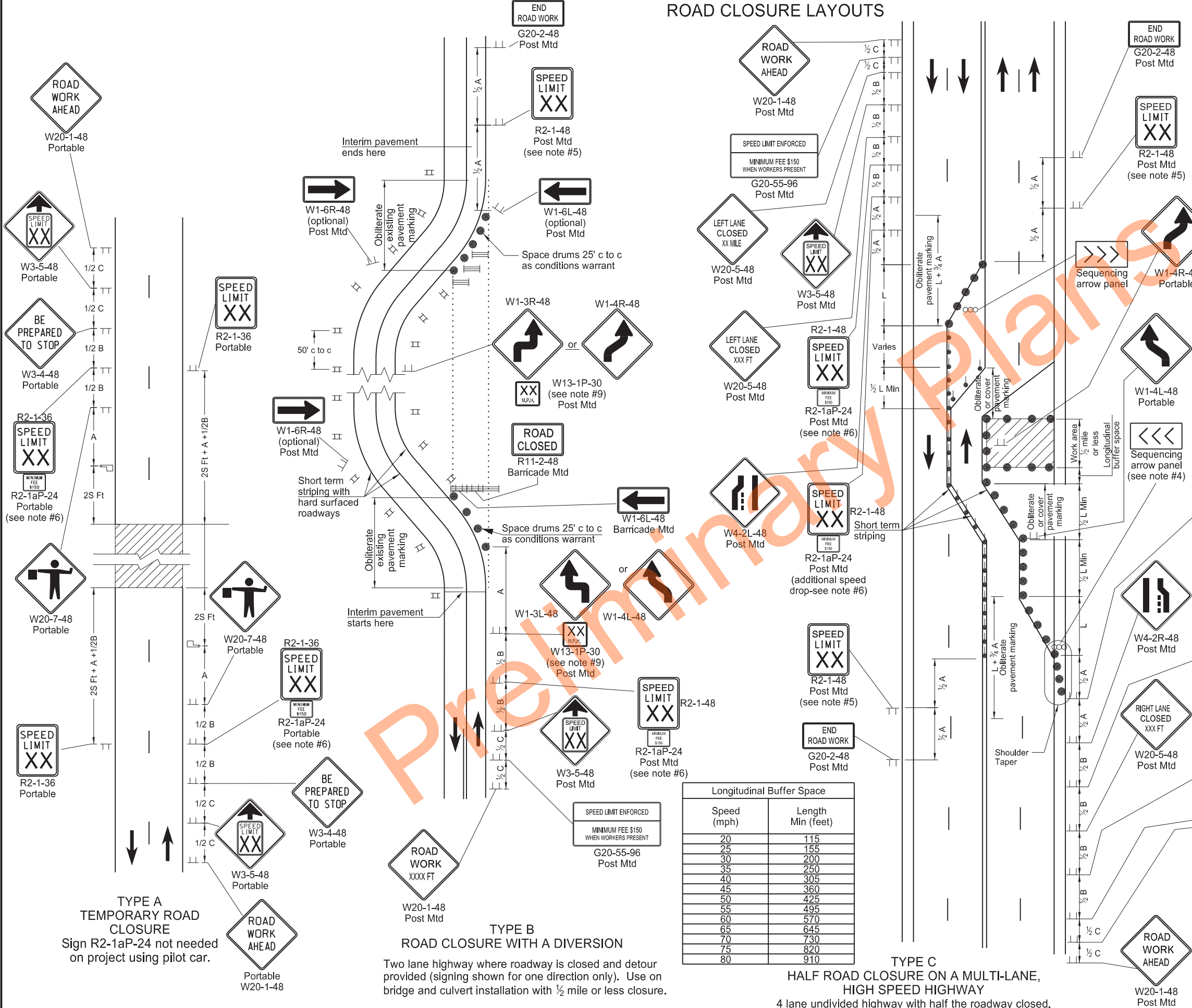
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
11-01-19	Revised details for Flexible Delineator
8-01-24	Electronic Stamp/Signature



08/01/24

08/01/24

ROAD CLOSURE LAYOUTS



- Notes:
- Variables
 - S = Numerical value of speed limit or 85th percentile.
 - W = The width of taper in feet.
 - L = Minimum length of taper, S x W for freeways, expressways, and other roads with speeds of 45 mph or greater, or W x S²/60 for urban, residential, and other streets with speeds of 40 mph or less.
 - Place barricades on moveable assemblies and signs on portable assemblies when located on roadway.
 - Place delineator drums, barricades or cones for tapering traffic at dimension "S" and for tangents space at 2 times dimension "S".
 - Place Sequencing Arrow Panels at the beginning of the taper when possible. Where shoulder width does not provide sufficient room, move the panel closer to the work area and place on roadway surface. See Shoulder Closure Standard Drawing.
 - Use Type A on roadways with slow moving traffic speeds and low volume (25 mph or less and 750 ADT or less).
 - Use Type B on roadways with moderate traffic speeds and volumes (40 mph or less and 5000 ADT or less).
 - Use Type C on roadways with high traffic speeds and volumes (over 40 mph or over 5000 ADT).
 - Re-establish speed. Determine exact speed limit in the field, dependent on location and conditions.
 - Determine the reduced speed limit based on the in-place speed limit before construction. Where speed reductions exceed 30 mph, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at 1/2 B.
 - Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
 - Cover existing speed limit signs within reduced speed zones.
 - Where necessary, engineer will determine safe speed.
 - As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
 - Sign G20-55-96 is not required if this layout is part of other traffic control that contains this sign, or the work is less than 15 days.
 - Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 80 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

KEY

Type III barricade

Sign

Delineator drum

Tubular markers

Work area

Flagger

Sequencing arrow panel

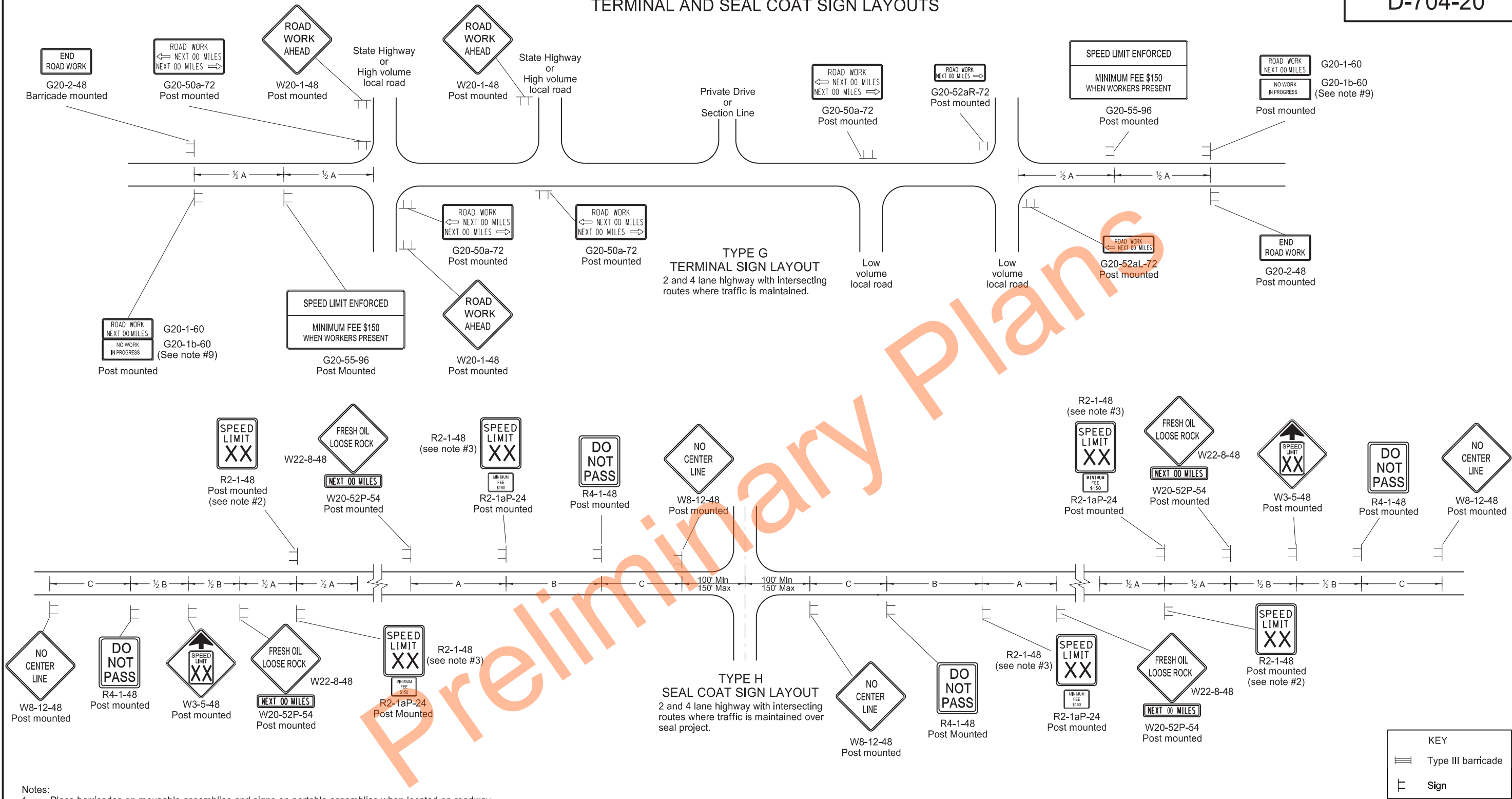
Vertical panels back to back

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
08-17-17	Updated Notes & Spd Limit signs
11-01-19	Sign, Notes, & Pmnt Mk updates
12-08-21	Switched order of Road Work Ahead and Spd Limit Enforced & added Dollars At Work
11-29-22	Removed Dollars At Work
06-30-25	Legislative Changes



TERMINAL AND SEAL COAT SIGN LAYOUTS

D-704-20



Notes:

- Place barricades on moveable assemblies and signs on portable assemblies when located on roadway.
- Determine the exact speed limit in the field, based on location and conditions.
- Determine the reduced speed limit based on the in place speed limit before construction. Where speed limit reductions exceed 30 MPH, install a second speed limit sign with the desired speed reduction (not to exceed 30 MPH.) Place the second speed limit sign at 1/2 B.
- Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
- Cover existing speed limit signs within a reduced speed zone.
- On seal coat projects, place signs R2-1-48, R2-1aP-24, R4-1-48, W22-8-48 and W20-52P-54 after all important intersections and at five mile intervals. Place sign W8-12-48 after all important intersections and at 2 mile intervals until short term center line pavement marking is placed.
- As an option, use portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Drawing D-704-14.
- Cover or remove speed limit signs from layout Type H when loose aggregate is removed.
- Install sign G20-1b-60 when work is suspended for winter.
- Use other traffic control layouts in immediate work areas. Place sign R2-1aP-24 below speed limit signs in reduced speed limit work areas.
- Sign G20-55-96 is not required if this layout is part of other traffic control that contains this sign, or the work is less than 15 days.
- Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

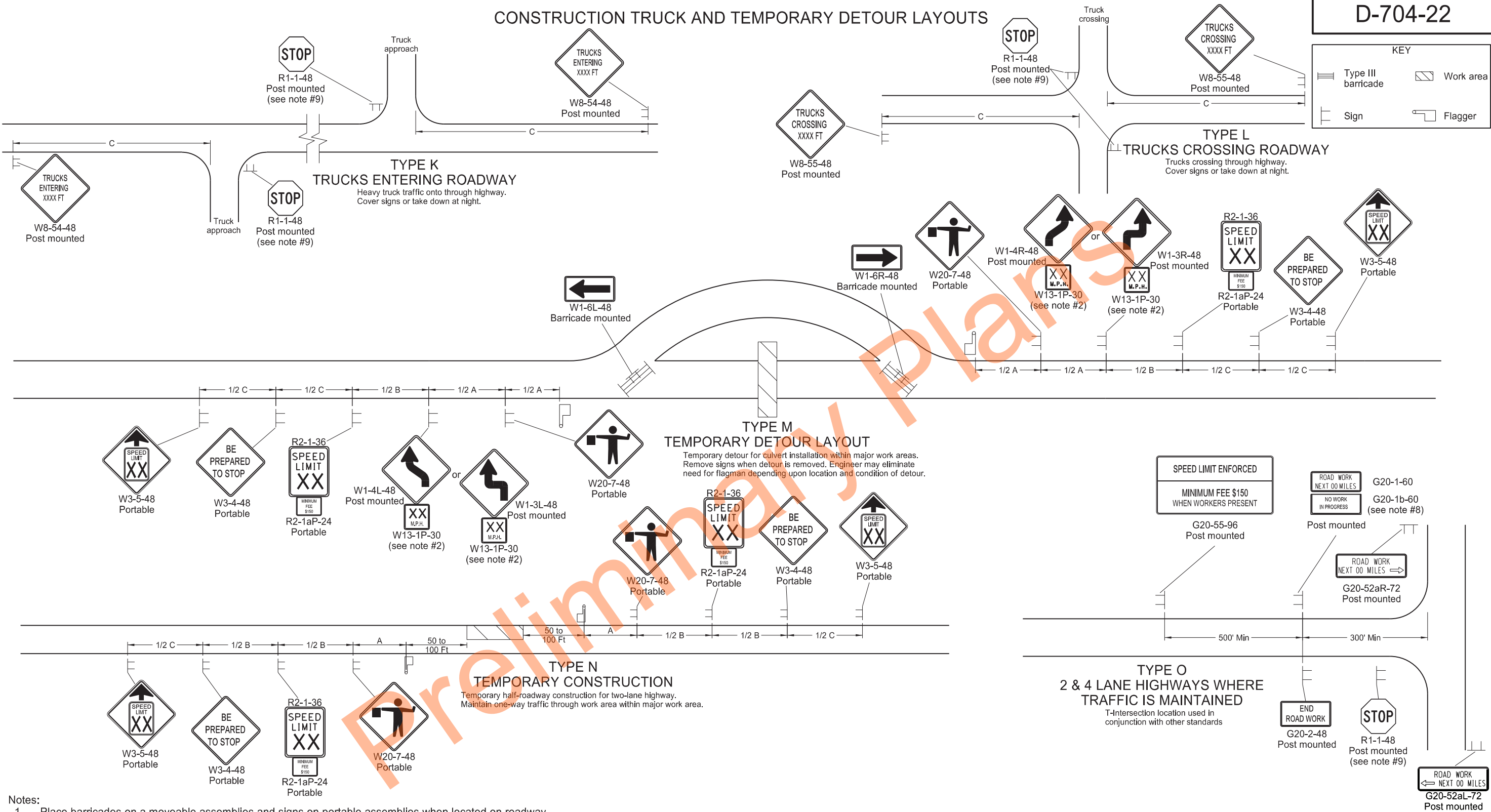
ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 80 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
08-17-17	Updated notes & sign numbers
11-01-19	Updated note & sign
12-08-21	Switched order of Road Work and Spd Limit Enforced & added Dollars At Work
11-29-22	Removed Dollars At Work
06-30-25	Legislative Changes



CONSTRUCTION TRUCK AND TEMPORARY DETOUR LAYOUTS

D-704-22



Notes:

1. Place barricades on a moveable assemblies and signs on portable assemblies when located on roadway.
2. Where necessary, safe speed to be determined by the Engineer.
3. Determine the reduced speed limit based on the in-place speed limit before construction. Where speed reductions exceed 30 mph, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at 1/2 B.
4. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
5. Cover existing speed limit signs within a reduced speed zone.
6. Covered (when approved by engineer) or obliterated pavement marking measured as Obliteration of Pavement Marking.
7. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
8. Install sign G20-1b-60 when work is suspended for winter.
9. If existing stop sign is in place, a 48" stop sign is not required.
10. Sign G20-55-96 is not required if layout is part of other traffic control that contains this sign, or if work is less than 15 days.
11. Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

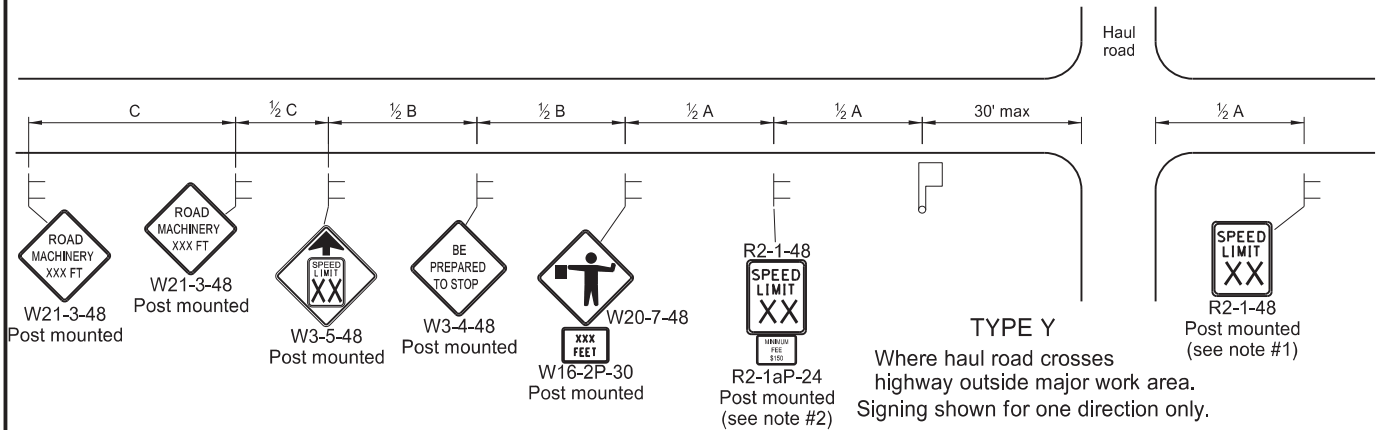
ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 80 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
08-17-17	Update notes & sign numbers
11-01-19	Revised sign numbers & note 7
12-09-21	Added Speed Limit Enforced and Dollars At Work signs
11-29-22	Removed Dollars At Work
06-30-25	Legislative Changes

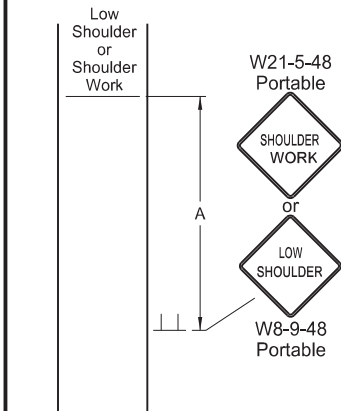
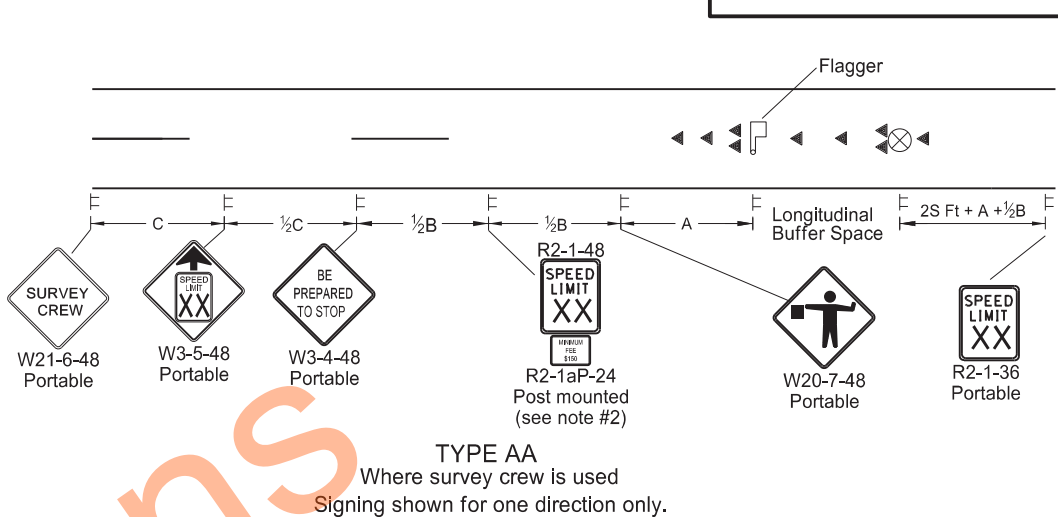


MISCELLANEOUS SIGN LAYOUTS

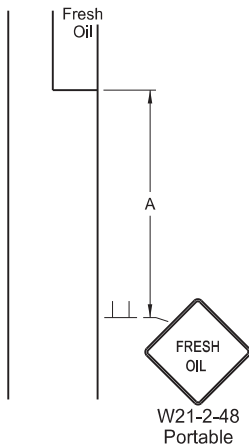
D-704-26



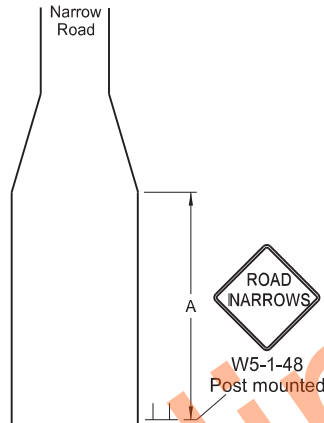
TYPE Z
Where speed zone is needed
Signing shown for one direction only.



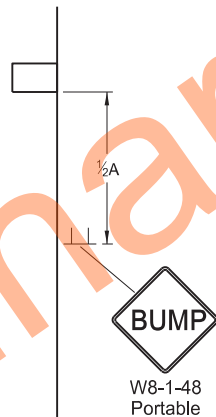
TYPE BB
Within major work area
where sign conditions exist



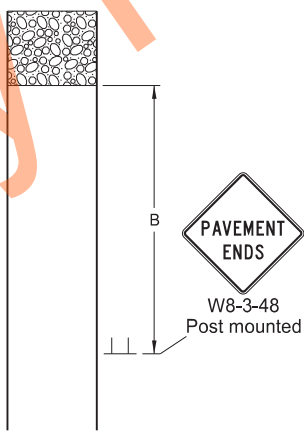
TYPE CC
Where sign conditions exist



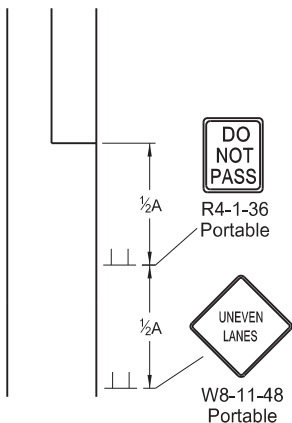
TYPE DD
Where sign conditions exist



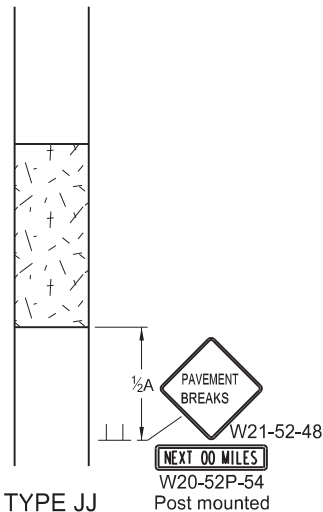
TYPE EE
Where sign conditions exist



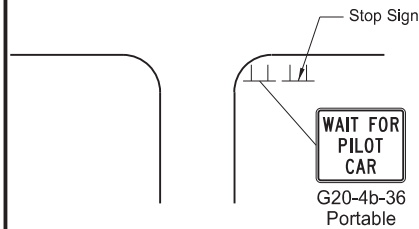
TYPE FF
Where sign conditions exist
Signing shown for one direction only.



TYPE GG
Where elevation difference
exists between lanes



TYPE JJ
For break in pavement.
Install signs when conditions exist
and remove when not applicable.
Signing shown for one direction only.



TYPE KK
At major intersections
within pilot car control area

- Notes
1. Re-establish speed limit. Determine exact speed limit in the field, dependent on location and conditions.
 2. Determine reduced speed limit based on in-place speed limit before construction. Where speed reductions exceed 30 mph, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at 1/2 B.
 3. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
 4. Cover existing speed limit signs within reduced speed zones.
 5. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
 6. Sign G20-55-96 is not required if this standard is part of other traffic control layouts, or work is less than 15 days.
 7. When pilot car operation is used, place sign G20-4b-36 "Wait For Pilot Car" at major intersections within pilot car control area.
 8. Recommend 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.
 9. Layouts shown for one direction only.

ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 80 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

Longitudinal Buffer Space	
*Speed (mph)	Length Min (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820
80	910

* Posted speed, off-peak 85th percentile speed prior to work starting, or the anticipated operating speed in mph.

KEY

Flagger

Sign

Cones

Survey Equipment

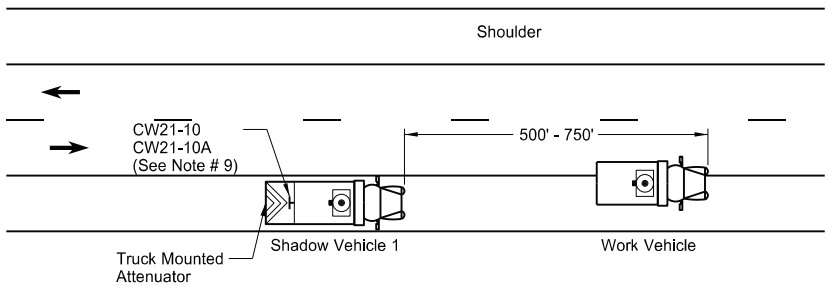
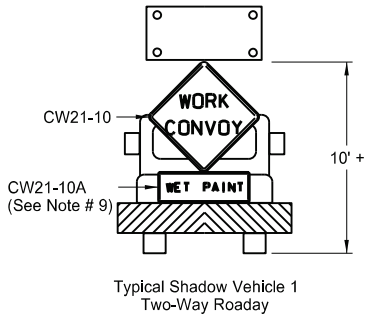
S = Numerical value of speed limit or 85th percentile.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
08-17-17	Added speed limit signs. Updated notes & sign numbers
11-01-19	Revised note 5 & sign numbers
02-23-23	Revised distance & removed signs
06-30-25	Legislative Changes

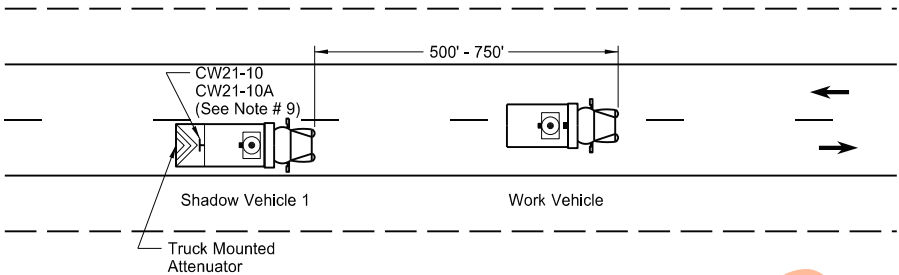


MOBILE OPERATION
(PAVEMENT MARKING)

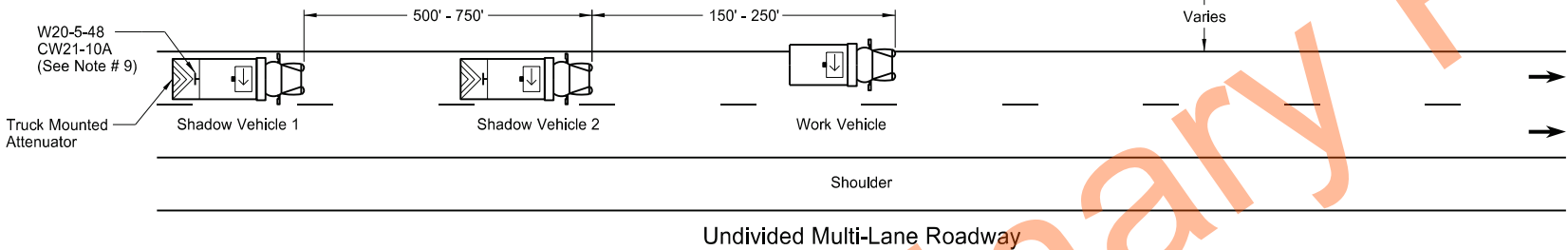
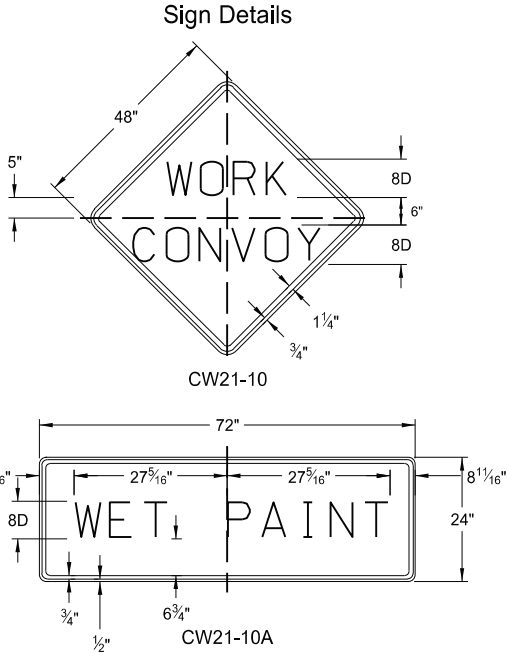
D-704-27



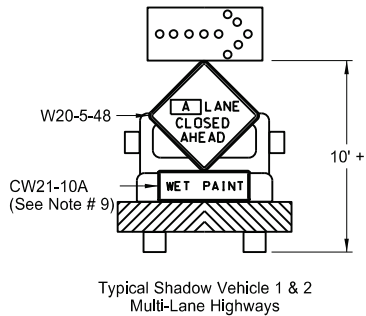
Two-Way Roadway with Paved Shoulders



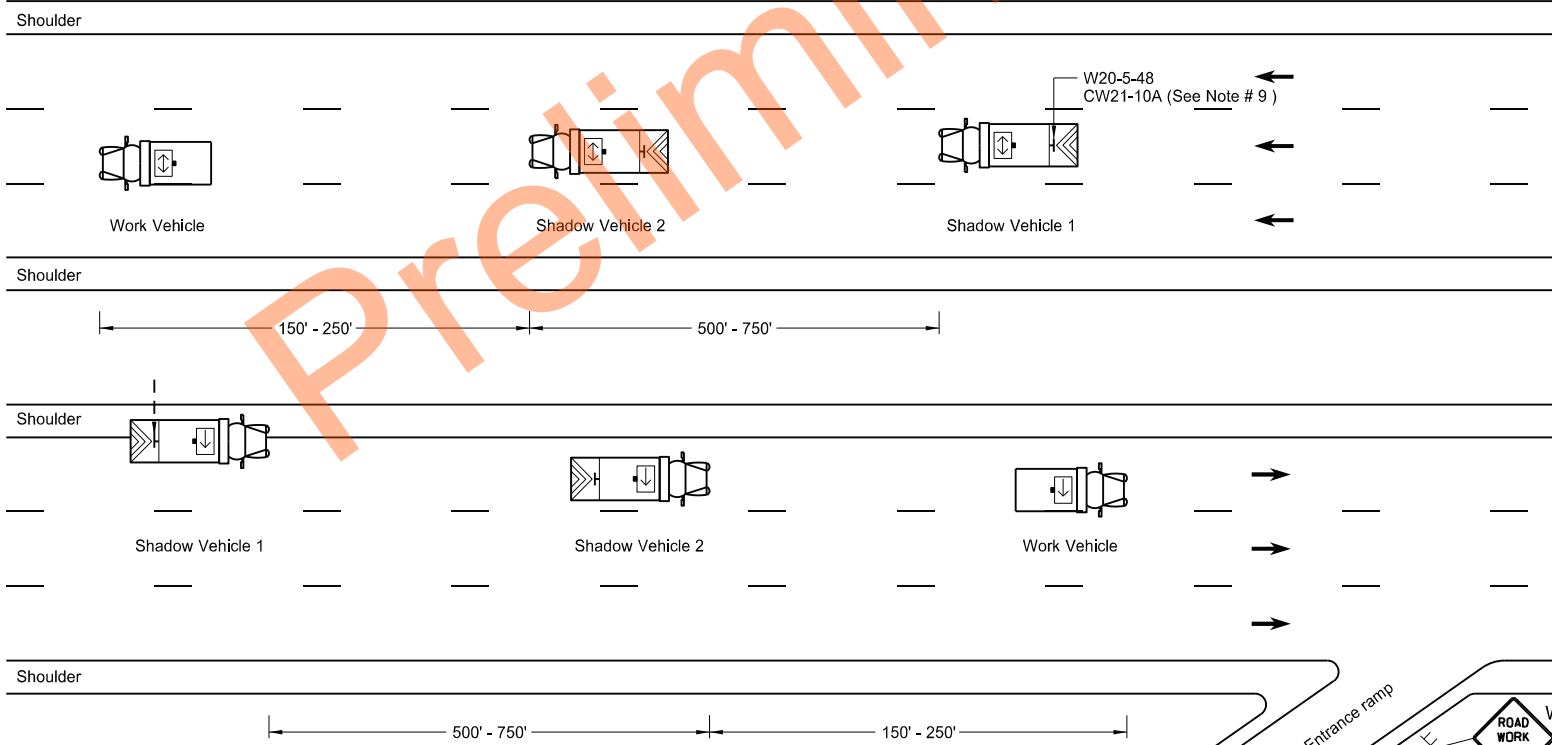
Two-Way Roadway without Paved Shoulders



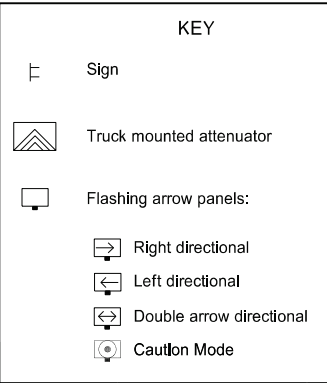
- Notes
1. Use additional vehicles you choose to be in the convoy with truck mounted attenuators, at your own expense.
 2. Display yellow rotating beacons or strobe lights on shadow and work vehicles, unless otherwise stated in the plans.
 3. Use Type B or Type C flashing arrow panels controlled from inside the vehicle.
 4. Provide each vehicle with two-way electronic communication capability.
 5. Move shadow vehicle 1 first to shadow other convoy vehicles when convoy changes lane.
 6. Vary vehicle spacing between shadow vehicle 1 and shadow vehicle 2 based on sight distance restrictions. Motorists approaching the work convoy need to see trail vehicle in time to slow down and/or change lanes as they approach shadow vehicle.
 7. Sign Colors
Letters = Black
Border = Black
Background = Orange
 8. As an option, use shadow vehicle 2 the paint tender vehicle.
 9. Use sign CW21-10A only during painting operation.
 10. Pull over work and shadow vehicles periodically to allow motor vehicle traffic to pass on two lane - two way roadways.



A = Left Right Center



Divided Multi-Lane Highway



NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
6-18-14	Removed shadow vehicle 2 on two lane roadways
9-27-17	Updated to active voice
11-08-19	Changed Standard Heading
6-02-24	Electronic Stamp/Signature.



08/02/24

Two-Lane Roadway Portable Rumble Strips

D-704-33

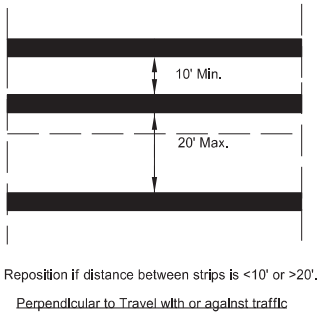
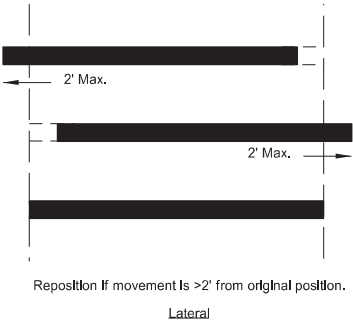
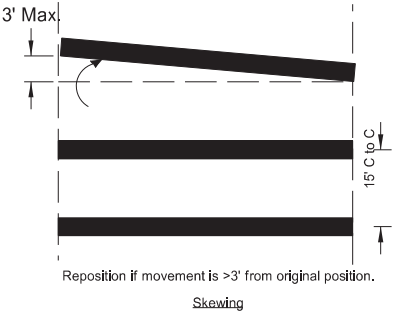
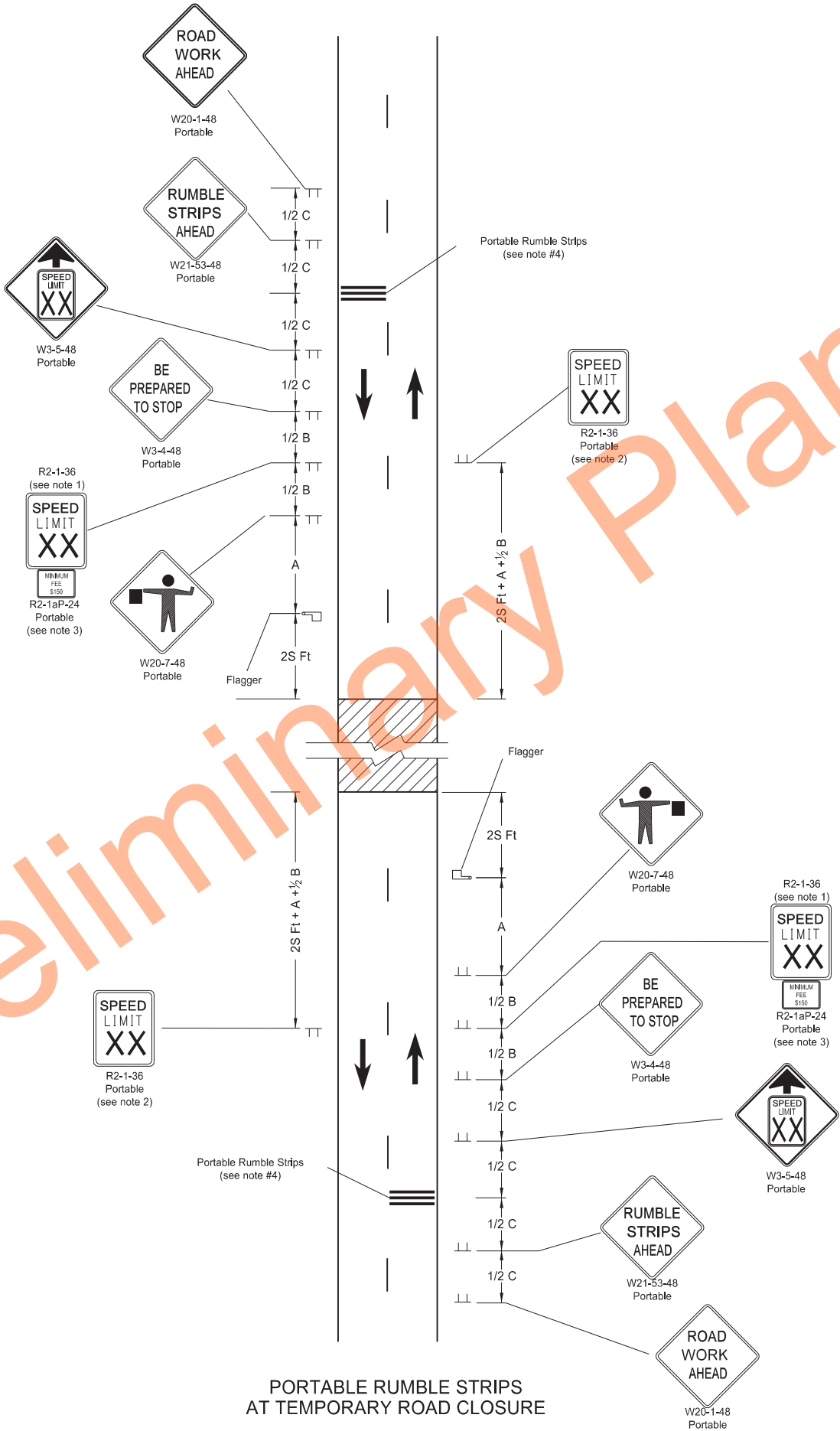
Work area

Flagger

Sign

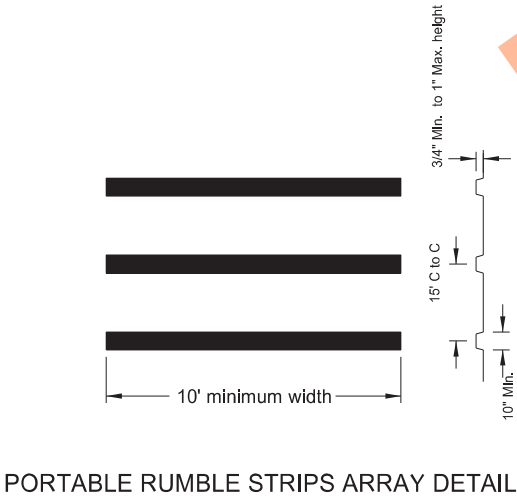
S = Numerical value of speed limit or 85th percentile.

ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - High Speed (over 45 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720



PORTABLE RUMBLE STRIPS ARRAY
TYPES OF MOVEMENT AND MAXIMUM ALLOWANCES

- Notes:
- Determine speed in the field based on location and conditions.
 - Re-establish the speed limit. Determine the exact speed limit in the field, dependent on location and conditions.
 - Sign R2-1aP-24 is not required when pilot car operation is used.
 - Do not use rumble strips on a non paved surface or in a pre-construction speed zone of 45 mph or less.



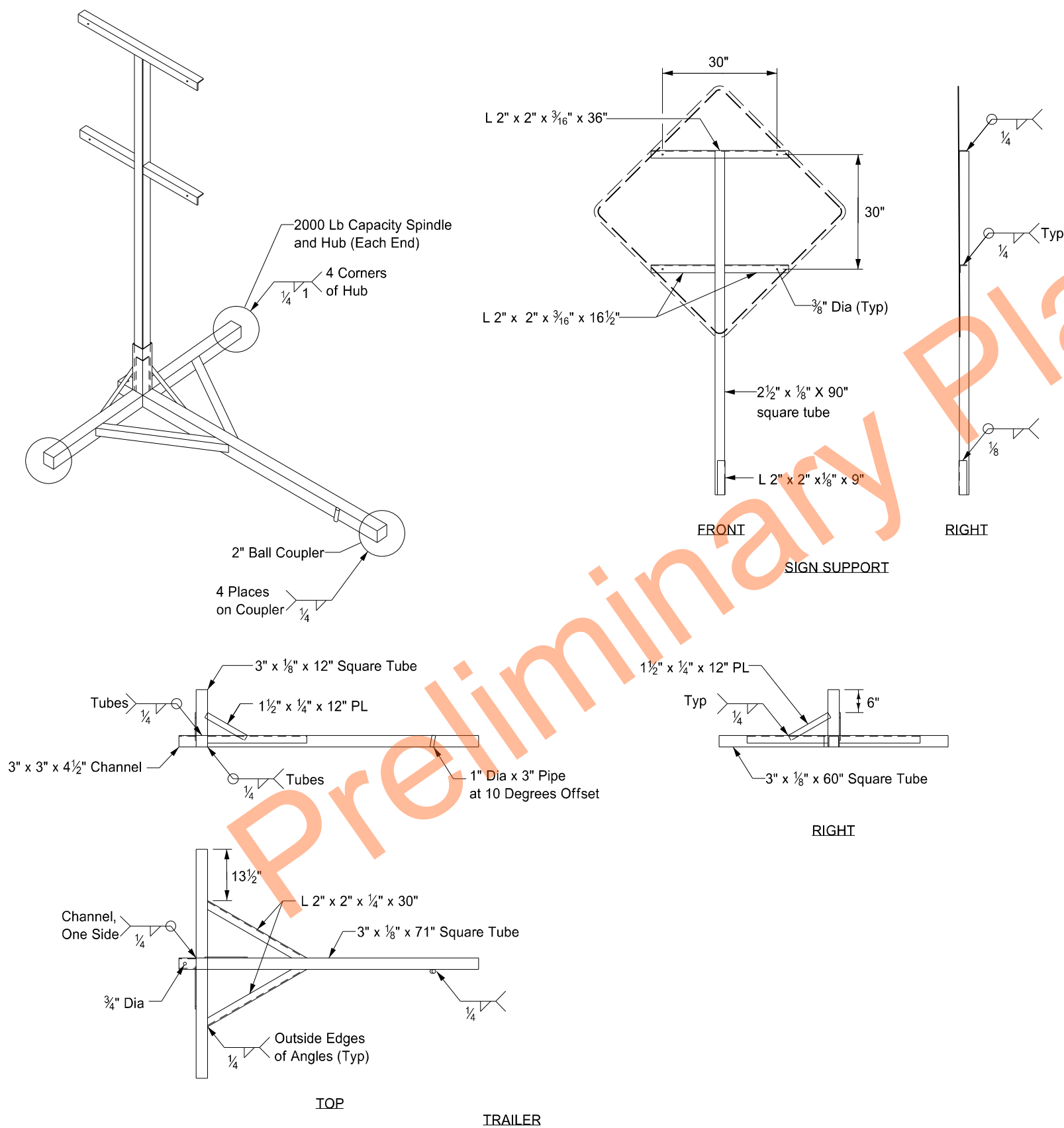
PORTABLE RUMBLE STRIPS
AT TEMPORARY ROAD CLOSURE

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
02-22-22	
REVISIONS	
DATE	CHANGE
03-07-23	Use changed to min 45 mph
06-30-25	Legislative Changes



PORTABLE SIGN SUPPORT ASSEMBLY

D-704-50



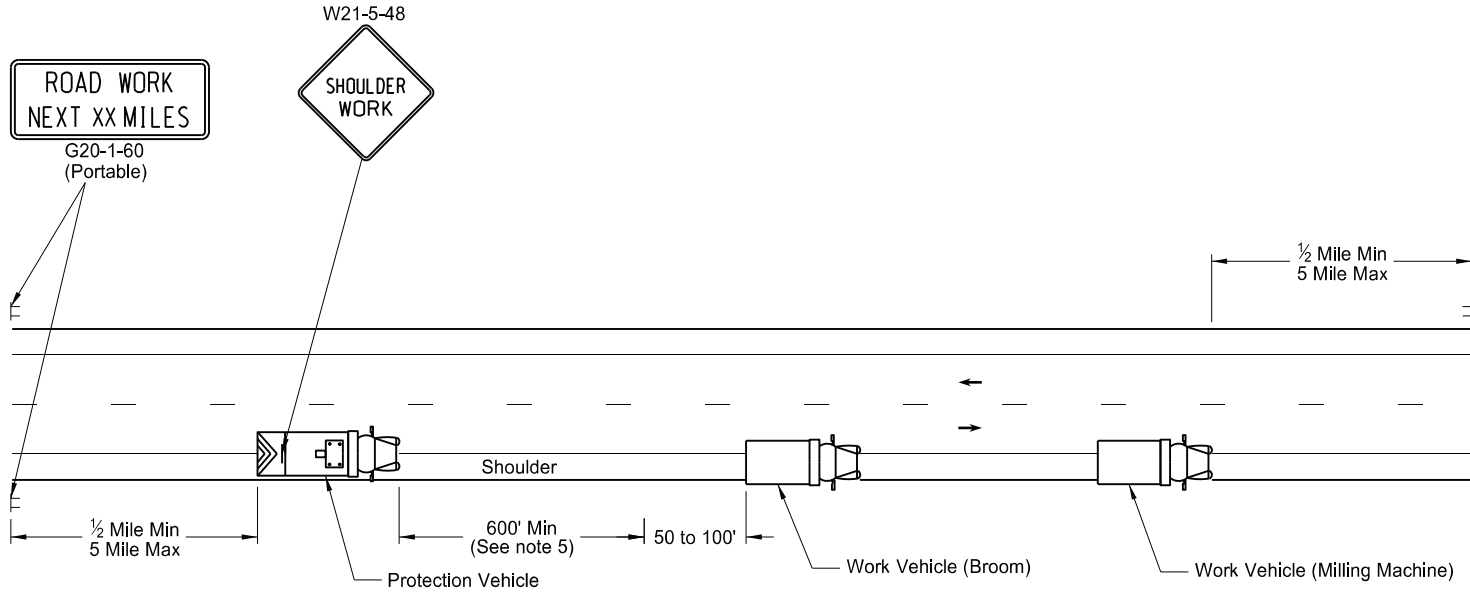
- Notes:
- ①. Maximum 250 pound weight of assembly.
 - ②. Use a 14" wheel and tire.
 - ③. Use no automotive and equipment axle assemblies for trailer-mounted sign supports.
 - ④. Other NCHRP 350 or MASH crash tested assemblies are acceptable.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-23-10	
REVISIONS	
DATE	CHANGE
12/02/2020	Updated Note to active voice.

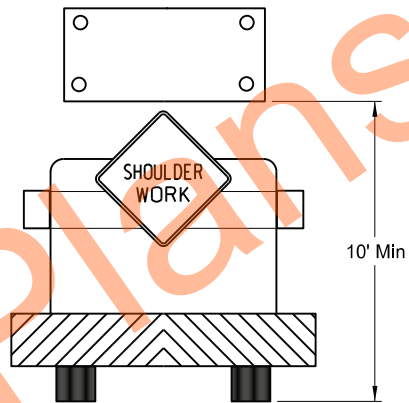
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA
12 02 2020

MOBILE OPERATION
Grinding Shoulder Rumble Strips

D-704-56

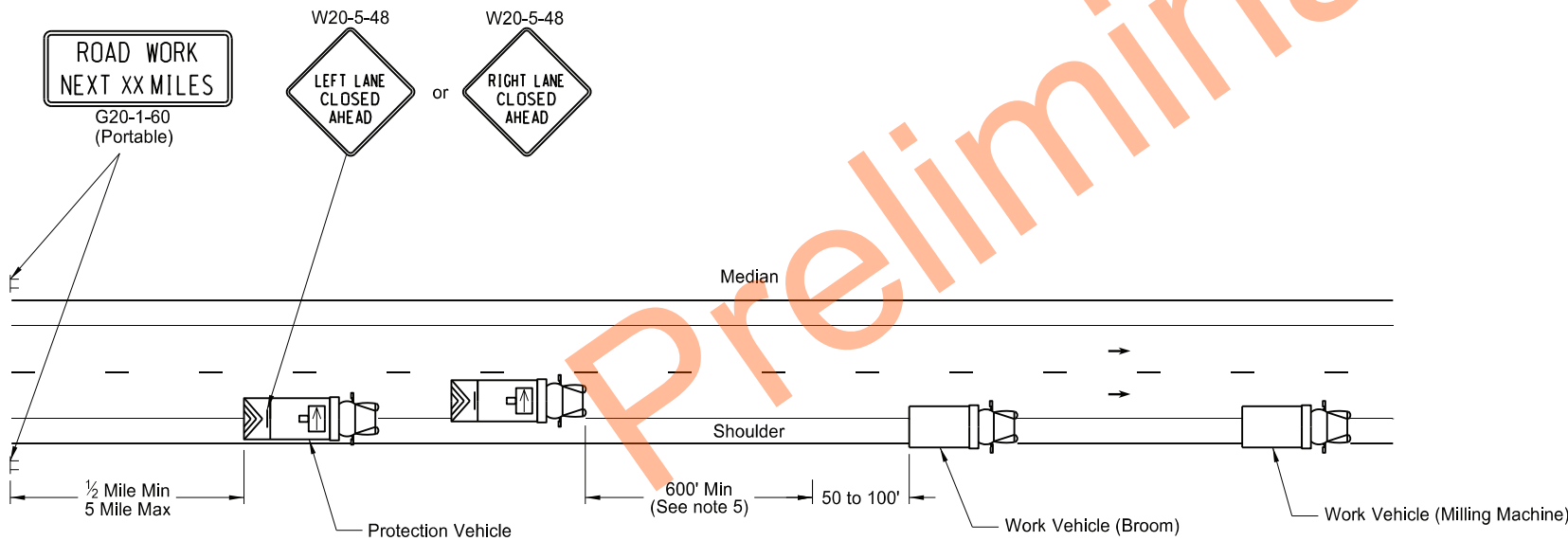


TWO LANE - TWO WAY ROADWAY

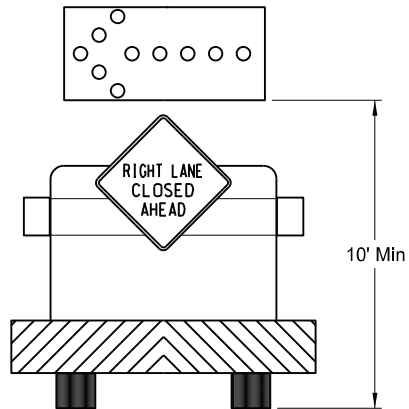


TWO LANE - TWO WAY ROADWAY

Typical Protection Vehicle with
Flashing Arrow Panel In Caution Mode



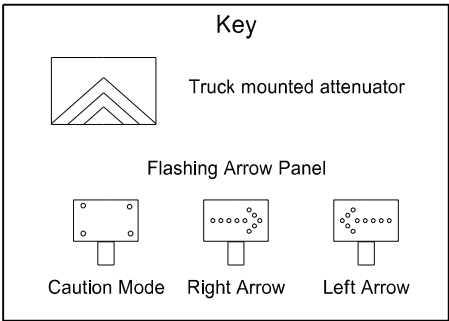
INTERSTATE & 4 LANE DIVIDED HIGHWAY



INTERSTATE & 4 LANE DIVIDED HIGHWAY

Typical Protection Vehicle with Flashing Arrow
Panel In Flashing Arrow Mode

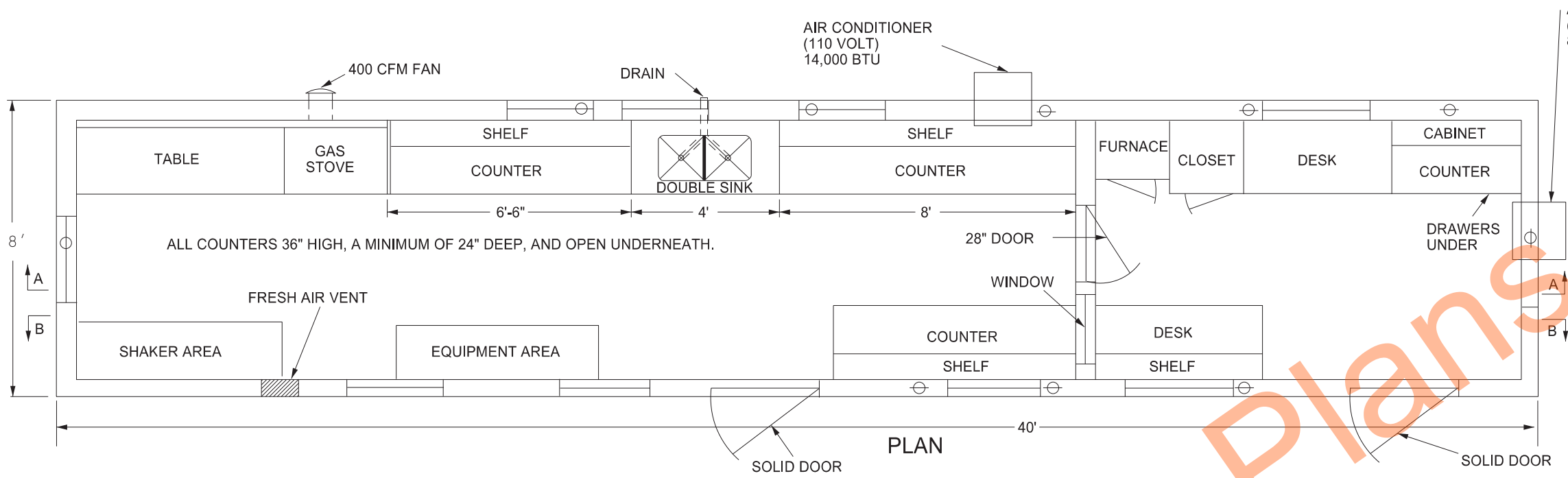
- Notes:
1. Provide truck mounted attenuators on additional vehicles in the convoy, at no additional cost.
 2. Provide rotating, flashing, oscillating, or strobe lights on vehicles.
 3. Provide Type B or Type C flashing arrow panels that are controlled from inside the vehicle.
 4. Provide two - way electronic communication capability in each vehicle.
 5. Vary vehicle spacing between the protection vehicle and work vehicle depending on sight distance restrictions. Keep the spacing of the convoy vehicles such that motorists approaching the work convoy can see the protection vehicle in time to slow down and safely pass the work vehicles.
 6. Move advance Road Work Ahead signs as the work area moves through the construction zone.



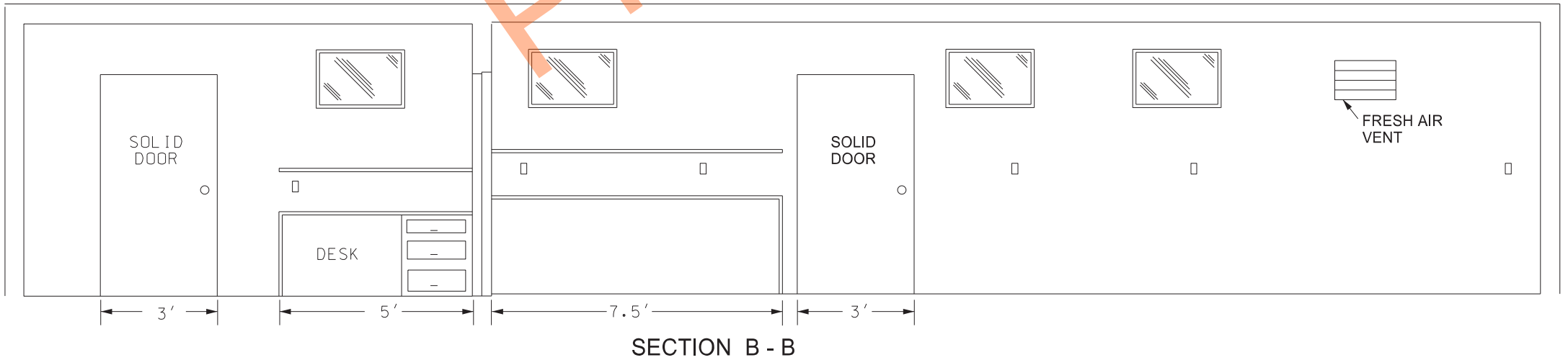
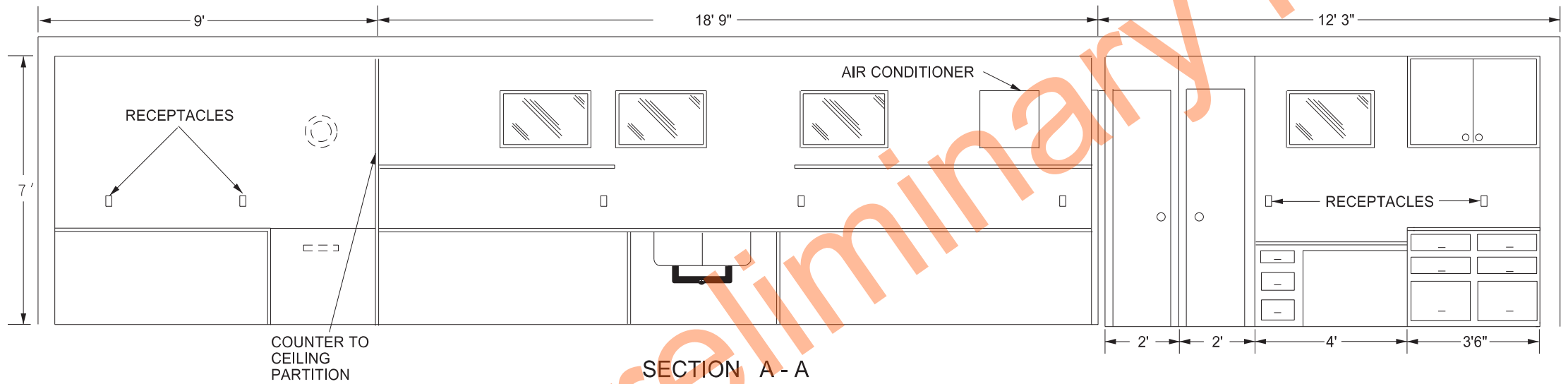
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-15-12	
REVISIONS	
DATE	CHANGE
8-17-17	Updated notes & signs
10-03-19	New Design Engineer PE Stamp
8-02-24	Electronic Stamp/Signature



D-706-1



- Provide a laboratory with the following:
1. A 1'x1' shelf at 36" above the regular countertop.
 2. Double compartment stainless steel sink, with each compartment a minimum of 16"x14"x10" deep. Provide water service lines made of copper or plastic and a diameter of ½ inch.
 3. An exhaust fan capable of removing inside air at a rate of 400 CFM.
 4. Fresh air vent hinged to open or close manually.
 5. 24" x 48" table capable of holding a 200 lb masonry saw with a minimum clearance of 36" above the table.
 6. A water supply tank with a capacity of 500 gallons and a 20 gallon capacity pressure tank on the pump.
 7. Heavy duty type locks, latches, and hinges for doors made to withstand the intense use in service.
 8. A wall between the office and the work area properly insulated to prevent the transmission of heat and noise.
 9. The steel cable tie downs and ground anchors at each corner of the lab.
 10. Electrical service entrance wired for 100 amps and separate circuits for air conditioners. Space convenience outlets in counter areas a minimum of four feet apart.

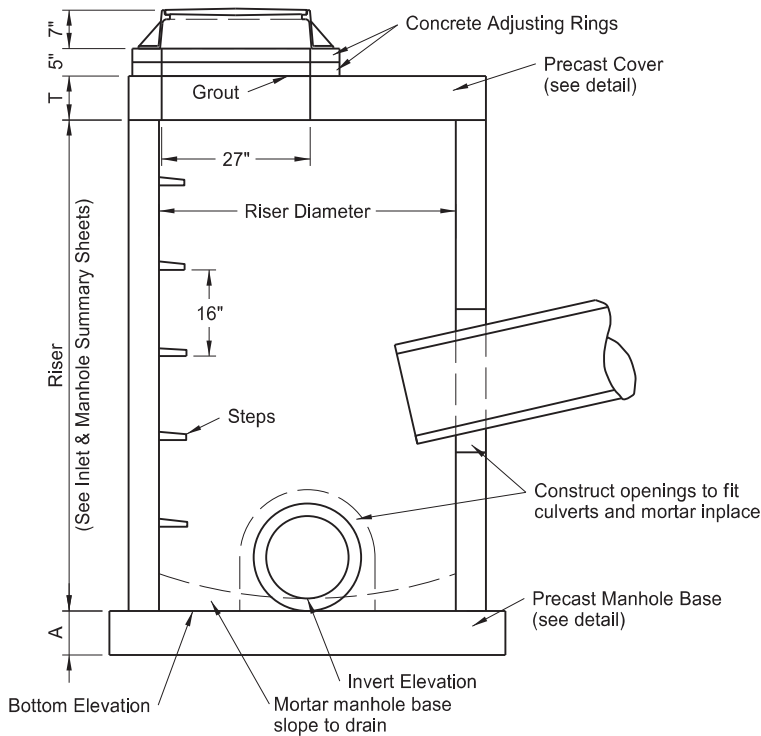


NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-03-13	
REVISIONS	
DATE	CHANGE
07-30-14	Changed standard's title and revised notes.
01-11-16	Revised notes.
08-27-19	New Design Engineer PE Stamp
08-09-24	Electronic Stamp/Signature.

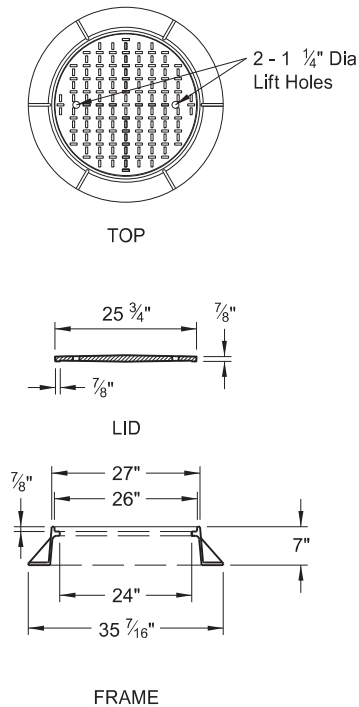


MANHOLE DETAILS

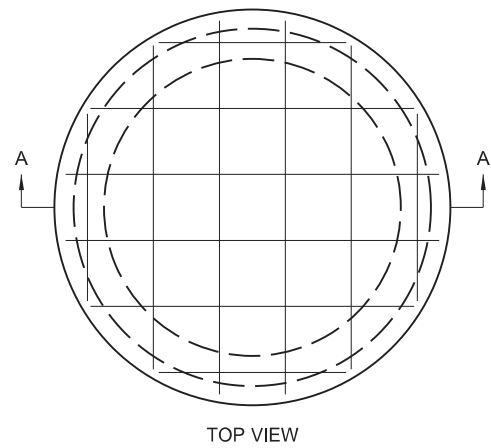
D-722-5



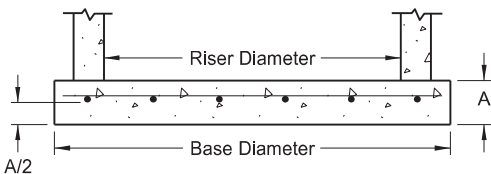
ELEVATION



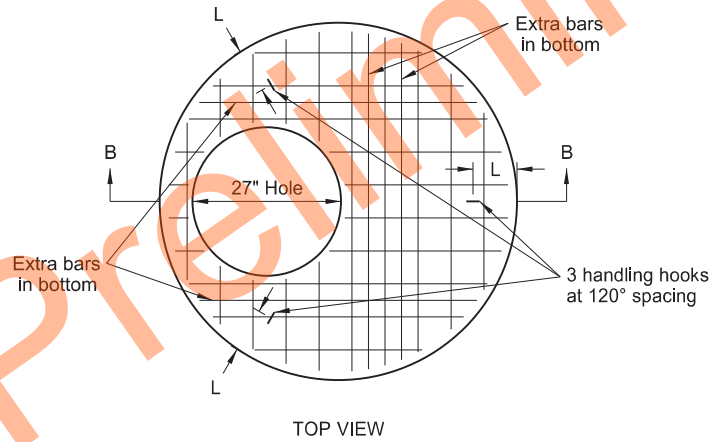
MANHOLE CAST IRON RING & COVER



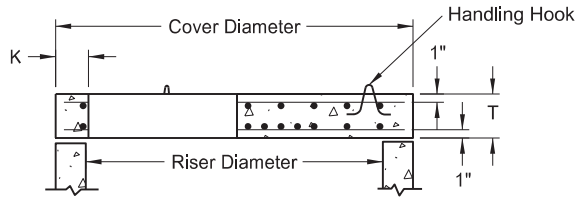
TOP VIEW



SECTION A-A
PRECAST MANHOLE BASE



TOP VIEW



SECTION B-B
PRECAST COVER

PRECAST MANHOLE COVERS

RISER DIAMETER	COVER DIAMETER	WEIGHT OF SECTION	T	K	L	BOTTOM * BARS	TOP * BARS
48"	58"	1,080 Lb	6"	6"	8"	#4 at 6"	---
54"	65"	1,910 Lb	8"	6"	8"	#4 at 6"	---
60"	72"	2,430 Lb	8"	7"	9"	#4 at 6"	#4 at 11"
66"	79"	3,010 Lb	8"	7"	9"	#4 at 6"	#4 at 11"
72"	86"	3,640 Lb	8"	8"	10"	#4 at 6"	#4 at 11"
84"	100"	5,060 Lb	8"	9"	11"	#5 at 6"	#5 at 11"
96"	114"	6,695 Lb	8"	9"	11"	#5 at 6"	#5 at 11"
108"	128"	12,810 Lb	12"	10"	12"	#5 at 6"	#5 at 11"
120"	142"	15,900 Lb	12"	11"	13"	#5 at 6"	#5 at 11"

* - Place reinforcement listed in each direction.

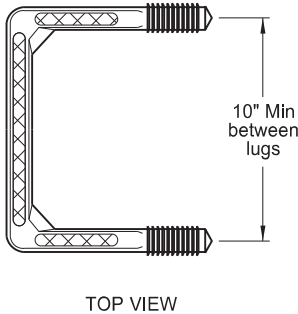
MANHOLE BASES

RISER DIAMETER	BASE DIAMETER	WEIGHT OF SECTION	A	BARS *
48"	66"	1,785 Lb	6"	#4 at 12"
54"	72"	2,830 Lb	8"	#4 at 12"
60"	78"	3,320 Lb	8"	#4 at 12"
66"	86"	4,035 Lb	8"	#4 at 12"
72"	92"	4,620 Lb	8"	#4 at 12"
84"	107"	6,245 Lb	8"	#4 at 12"
96"	120"	7,855 Lb	8"	#4 at 12"
108"	132"	14,255 Lb	12"	#4 at 8"
120"	148"	17,925 Lb	12"	#4 at 8"

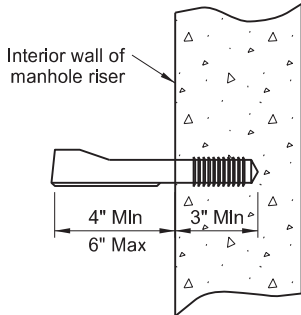
* - Place reinforcement listed in each direction.

NOTES:

1. Use class AE concrete precast or cast-in-place bases constructed in accordance with NDDOT Standard Specifications. Use aggregate size approved by the engineer.
2. Use precast concrete manholes, risers and steps conforming to AASHTO M199.
3. Reinforce precast concrete bases and covers as shown in the table for the corresponding riser diameter.
4. Use Grade 60 reinforcing steel.
5. Cut or Precast manhole riser bottoms square to fit the manhole base. Grout joint between base and riser with cement mortar.
6. The manhole riser length listed in the plans is based on a 7" manhole casting, plus 2 concrete adjusting rings (5"), plus the "T" dimension shown in the Precast Manhole Covers table.
7. Use corrosion resistant manhole steps with a minimum 800 pound vertical load resistance and a minimum 400 pound horizontal pull-out resistance. Use configuration of steps approved by the Engineer.
8. Precast concrete manhole covers shown are designed for an HS-20 wheel load and maximum fill height of 15'-0". Special design is required for heavier wheel loads and/or greater fill heights.
9. Use of other castings, similar in dimension, is allowed if the casting conforms to the manhole cover and has a lid style specified in the plans. Modifications to the manhole cover to facilitate similar castings are only allowed with written approval from the Engineer.
10. Use castings manufactured in accordance with AASHTO M306-09. Use metal conforming to AASHTO M105 Class 35B in the manufacture of castings.
11. Pipe shall be installed to extend a minimum of 2 inches beyond the inside face of the structure wall at each end. Payment will be based on the actual installed length of pipe between structures, measured end-to-end and rounded to the nearest whole foot.



TOP VIEW

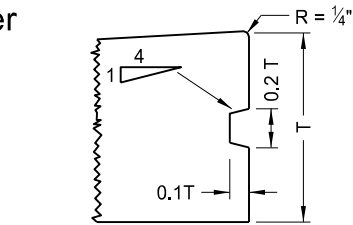
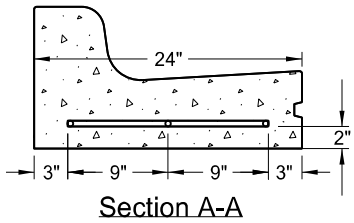
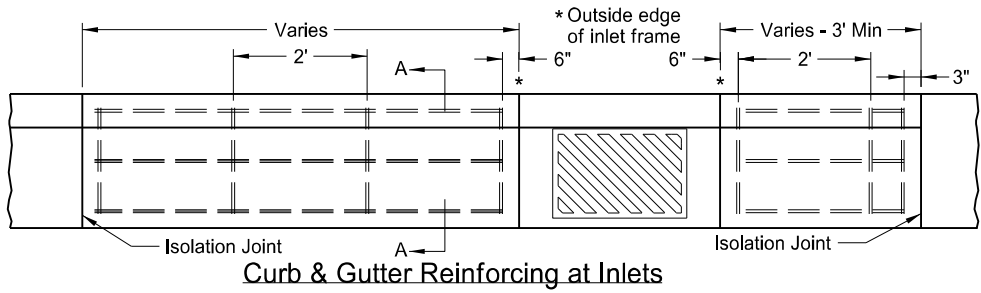


STEP DETAIL

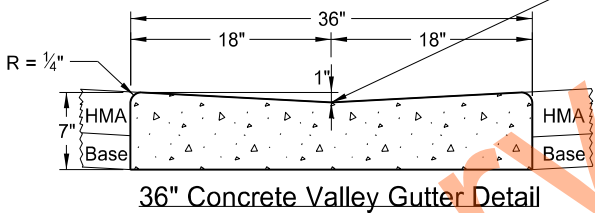
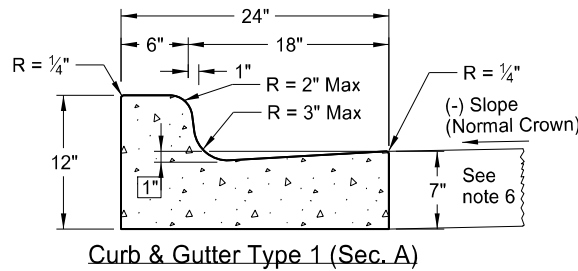
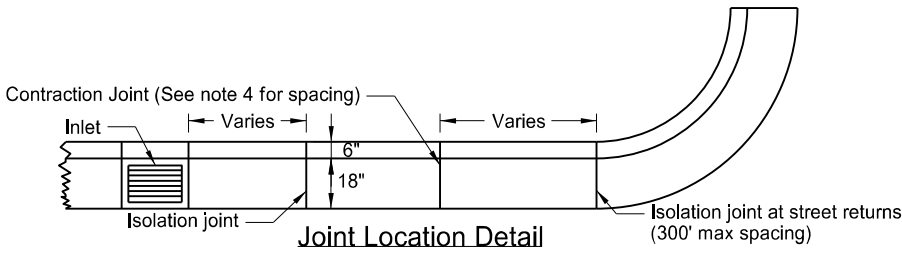
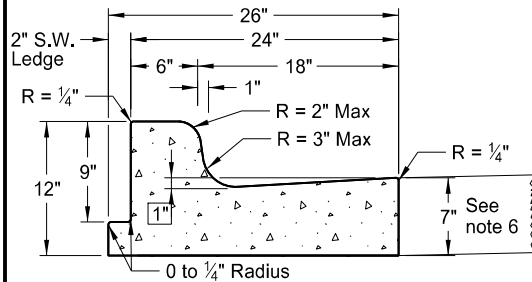
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
05-14-2013	
REVISIONS	
DATE	CHANGE
6-24-14	Revised notes 1 & 6, added dimensions to Elev. drawing.
10-17-17	Updated to active voice.
12-02-20	Updated PE stamp and signature.
07-24-25	Note Revisions



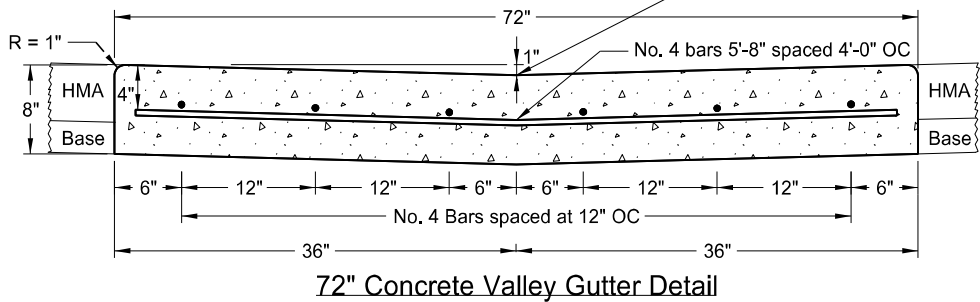
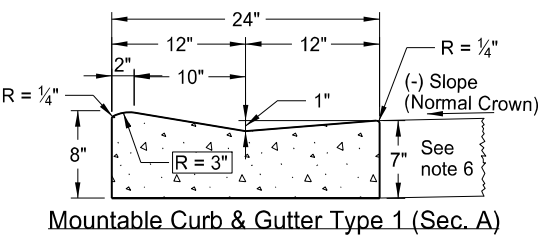
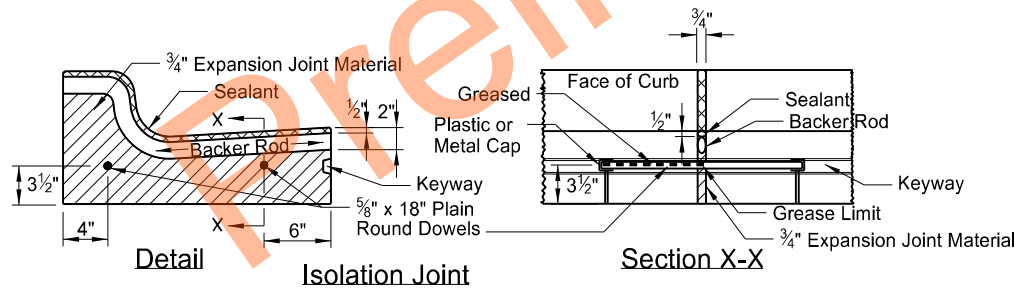
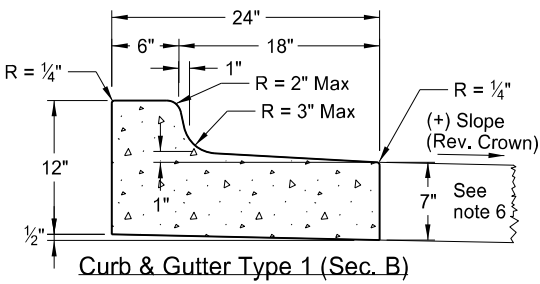
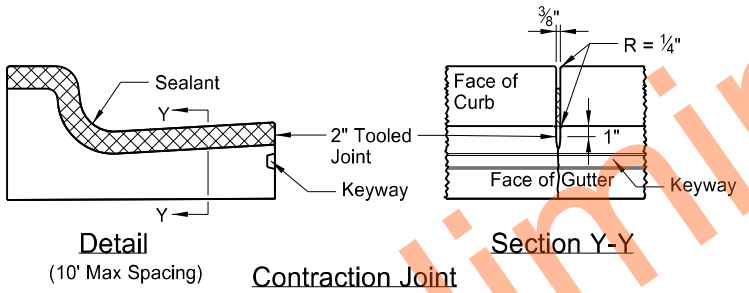
Curb & Gutter and Valley Gutter



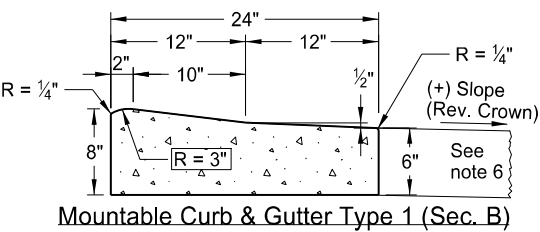
- NOTES:**
1. Use Curb and Gutter Type 1 (Sec. A & B). Use section "A" with (-) pavement slopes and section "B" with (+) pavement slopes.
 2. Contraction Joints: Tool the Curb & Gutter 2" as shown on the contraction joint details.
 3. Isolation Joints: Use $\frac{3}{4}$ " expansion joint material for isolation joints. Form the backer rod and joint sealant opening with a pre-cut piece of wood or other material approved by the engineer. Dowel supports are not required on the second pour at a cold joint. Install plastic or metal caps and greased dowels in the cold joint for the second pour.
 4. Joint Spacing: For hot mix asphalt pavements use a 10' max joint spacing for the curb and gutter with panels on each side of the inlets. For concrete pavements match the joint spacing for the curb and gutter to the pavement joint on PCC Pavements (approximately 15' spacing.)
 5. Joint sealing: For contraction joint, use joint sealant that conforms to section 826.02B. Use sealant for expansion joints specified in note 3 above. Tool and install sealant in accordance with the manufacturer's recommendations.
 6. Curb & Gutter-Pavement Interface: For hot mix asphalt pavement use gutter depth shown. For PCC pavements, either match gutter depth to adjacent pavement depth or construct gutter radius shown.
 7. Tie curb and gutter to abutting PCC pavement with No. 4 bars, 2'-0" in length, spaced at 3'-9" centers for 15' joint spacing (maximum spacing of 4' centers).
 8. On street returns and other locations where new curb and gutter ends and does not abut existing curb and gutter, taper the last two (2) feet of the curb from 6" in height to 0". Install a 1/2" premolded full depth isolation joint (the same shape as the curb and gutter just ahead of the taper) with an 18" plain round bar across the joint.
 9. Valley Gutter Joints: Form, saw, or score $\frac{1}{8}$ " min. to $\frac{3}{8}$ " max. width contraction joints (a minimum 2" depth) at approx 10' intervals. Seal the joints with hot poured elastic type joint sealer (Section 826.02A.2 of the Standard Specifications.) Include all costs for the joint and sealant in the price bid for Valley Gutter.
 10. Reinforcing at Inlets: Use #4 deformed reinforcing bars without splices. Include all costs for reinforcing bars at inlets (even inlets located on radii) in the price bid for "Curb & Gutter - Type 1" or "Curb & Gutter Mountable - Type 1." Extend reinforcement to the second joint (with rebar placed through the first joint) in cases where the 3' minimum panel length can't be obtained.



36" Concrete Valley Gutter Plan



72" Concrete Valley Gutter Plan



NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-7-2013	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice.
08-27-19	New Design Engr PE Stamp.
10-30-24	Revised bar size & notes.



10/30/24

SIDEWALK

D-750-2

NOTES:

1. Curb ramp and detectable warning panel layouts for informational purposes only. See Standard Drawing D-750-3 for curb ramp and detectable warning panel details.
2. Joint Spacing: Vary transverse contraction joint spacing from 4' to 6' to create approximate square panels.

Use longitudinal contraction joints when sidewalk width is 8' or greater, and space at half the sidewalk width.

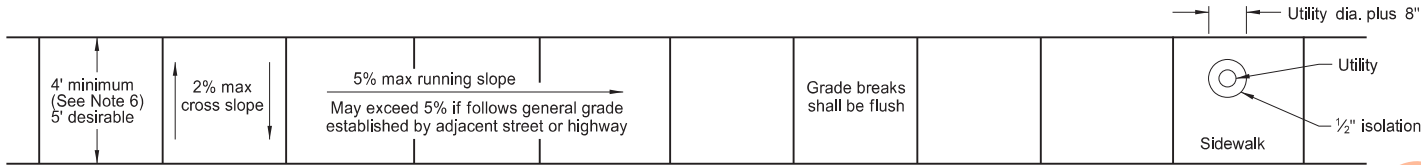
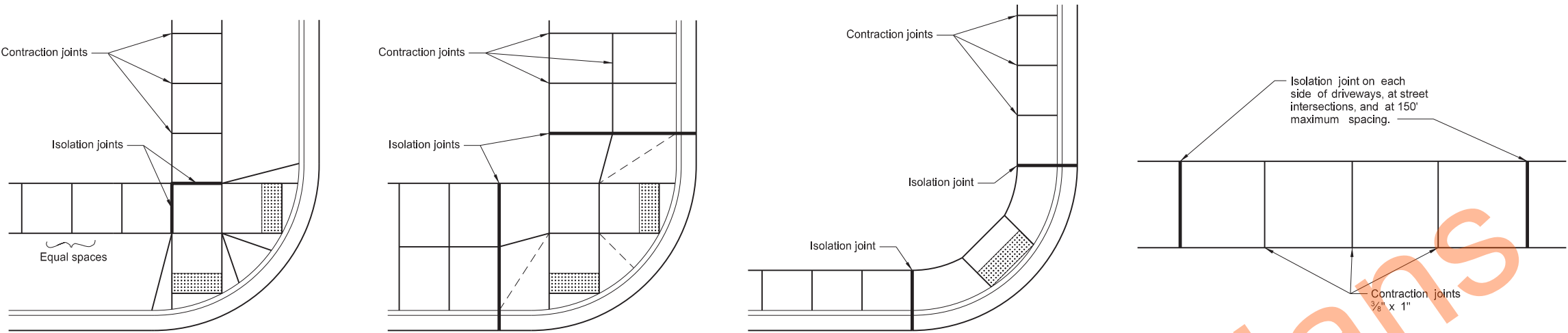
Saw or groove contraction joints to a minimum depth of 1/3 the depth of the concrete.

When sidewalk is adjacent to curb & gutter, vary the sidewalk joint spacing to match curb & gutter joints.

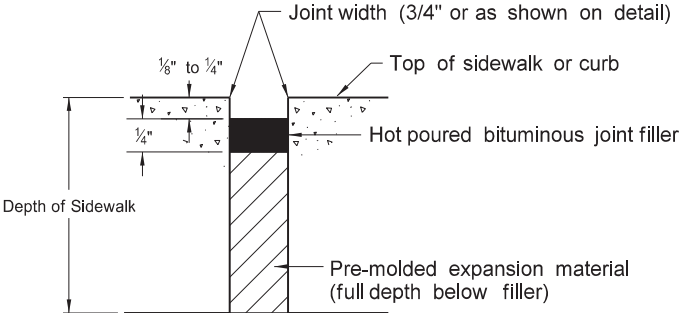
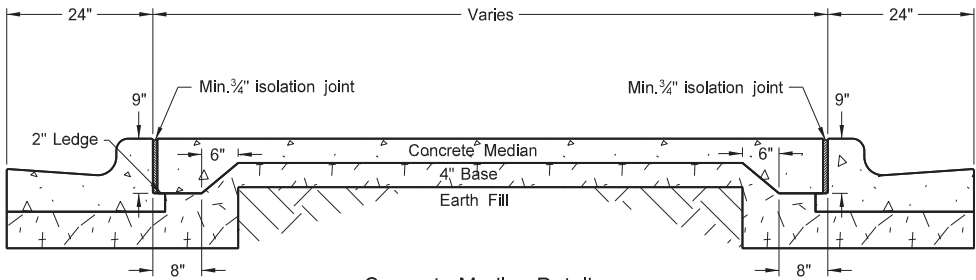
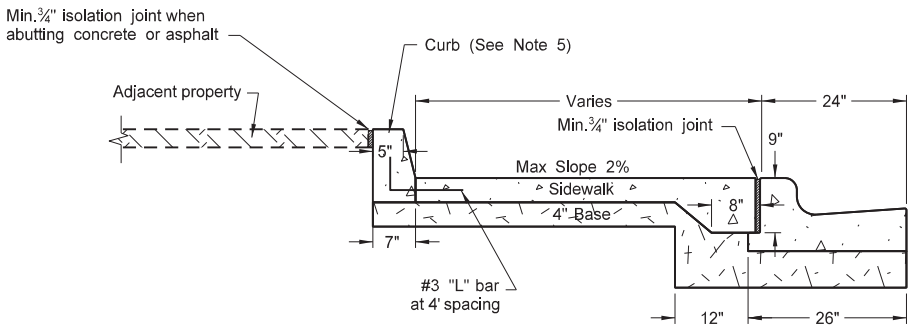
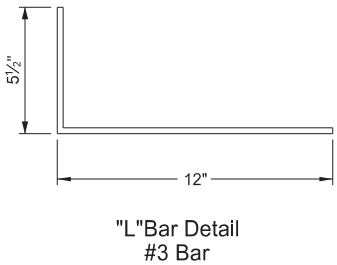
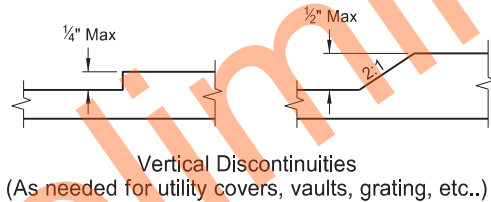
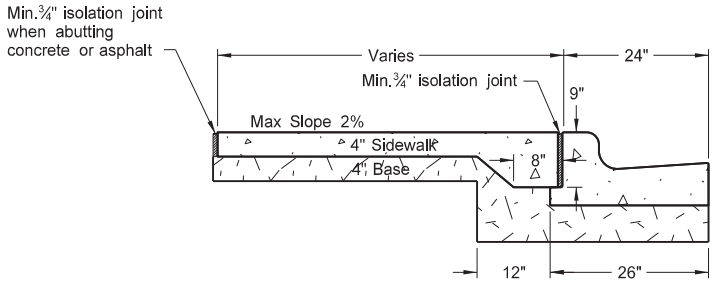
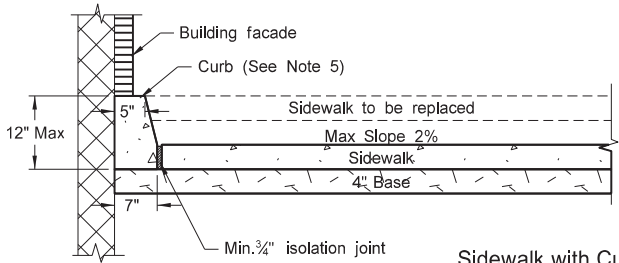
Use isolation joints between separate concrete pours, or between old and new concrete.
3. Include all costs for labor, equipment, and material necessary to construct contraction and isolation joints in the price bid for sidewalk concrete.
4. Use 4" sidewalk concrete thickness unless otherwise specified.
5. Use 4" base material thickness unless otherwise specified. Include all costs for labor and materials necessary to place the base material in the price bid for "Salvage Base Course" or "Aggregate Base Course CL 5."

Modify existing ground slope with landscaping as needed. If not possible, such as adjacent buildings, use a vertical curb as shown in the detail below. The Engineer will measure curb at the unit price bid for "Curb - Type I" per lineal foot.
6. Sidewalk Width & Grade: Provide a continuous 4' min clear width pedestrian access route with max 2% concrete cross slope, excluding flares. The width of the curb cannot be counted as part of the pedestrian access route.

When clear width of pedestrian access routes is less than 5.0', provide passing spaces at a maximum of 200' with a minimum size of 5.0' by 5.0'.



Utility Blockout



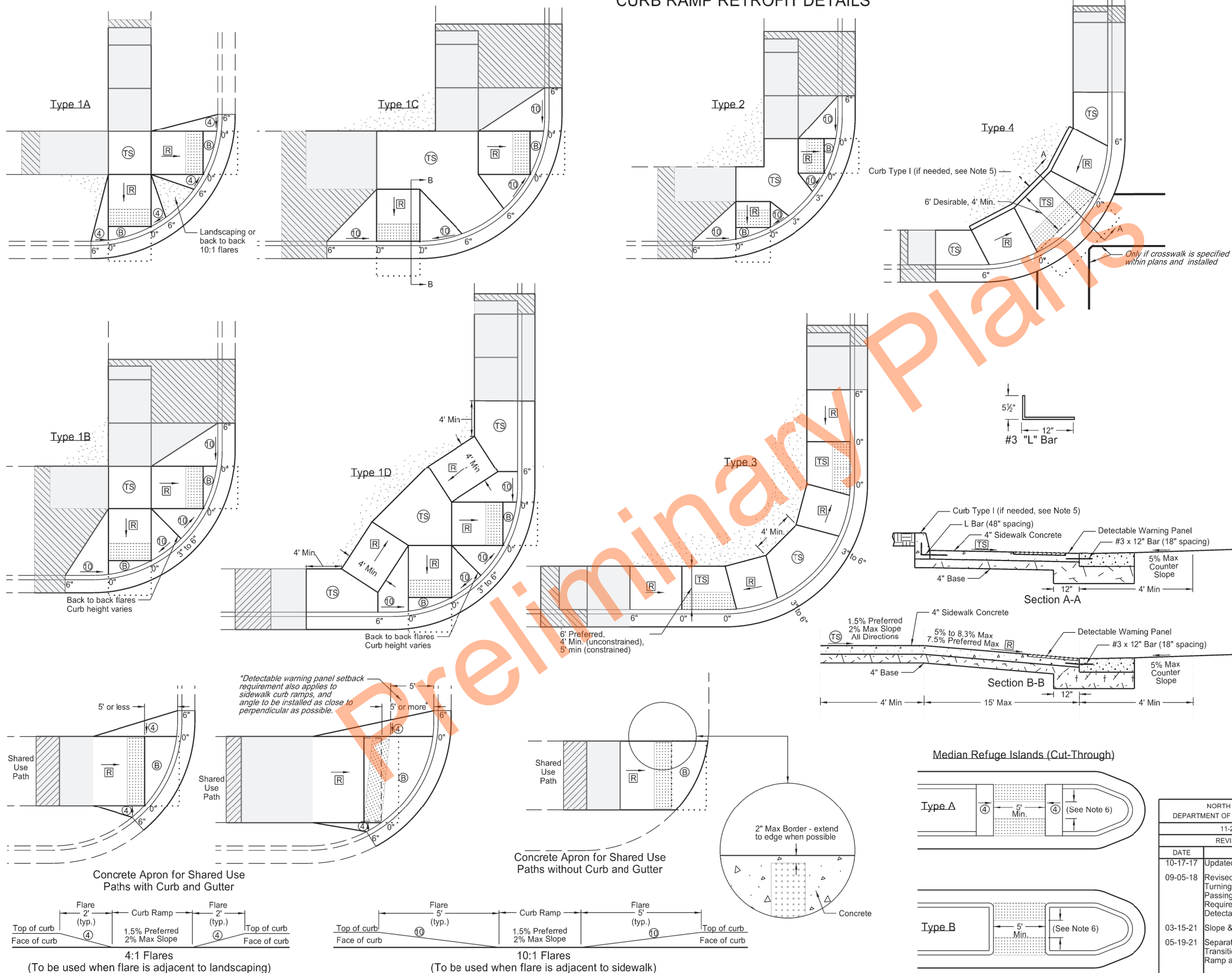
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-26-13	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice.
09-05-18	Added sidewalk details for width & grade & passing lane requirements.
08-27-19	New Design Engineer PE Stamp.
08-09-24	Electronic Stamp/Signature.



08/09/24

CURB RAMP RETROFIT DETAILS

D-750-3



- NOTES:
1. Ramp width is the useable portion of the ramp, excluding flares. Match curb ramp width to Existing Pedestrian Facility (EPF) width (4' minimum or 5' for island ramps.) Match ramp width to existing shared use path width. Maximum ramp length is 15'.
 2. Provide turning space with desirable 5' x 5' size or larger and minimum 4' x 4' unconstrained size, for any change of direction. Provide landing 5' long x width of path at the bottom and top of parallel ramps and at the top of perpendicular ramps. Turning spaces and Landings may overlap.
 3. Match detectable warning panel width to ramp width. Radial panels are allowed. Place detectable warning panel within the lower turning space.
 4. Provide a continuous 4' minimum width EPF with 1.5% preferred cross slope and max 2% constructed cross slope.
 5. Modify existing ground slope with landscaping, as needed. If not possible, use a vertical curb as detailed on Standard D-750-2. The Engineer will measure curb at the unit price bid for "Curb - Type 1" per lineal foot.
 6. Islands: If the profile of the island curb ramp is 2% or less, provide a minimum distance of 2' between warning panels. If the profile of the island curb ramp is steeper than 2%, provide a turning space between the ramps.
 7. Provide generally planar vertical alignments. Provide grade breaks, perpendicular to the direction of the pedestrian travel, at the top and bottom of curb ramps (1.5% preferred, 2% max constructed cross slope).
 8. See Curb Ramp Retrofit Transition Details Standard D-750-4 for additional information. Also See PROWAG for full compliance in the curb ramp area.
 9. Grade transitions shall be flush.

LEGEND:

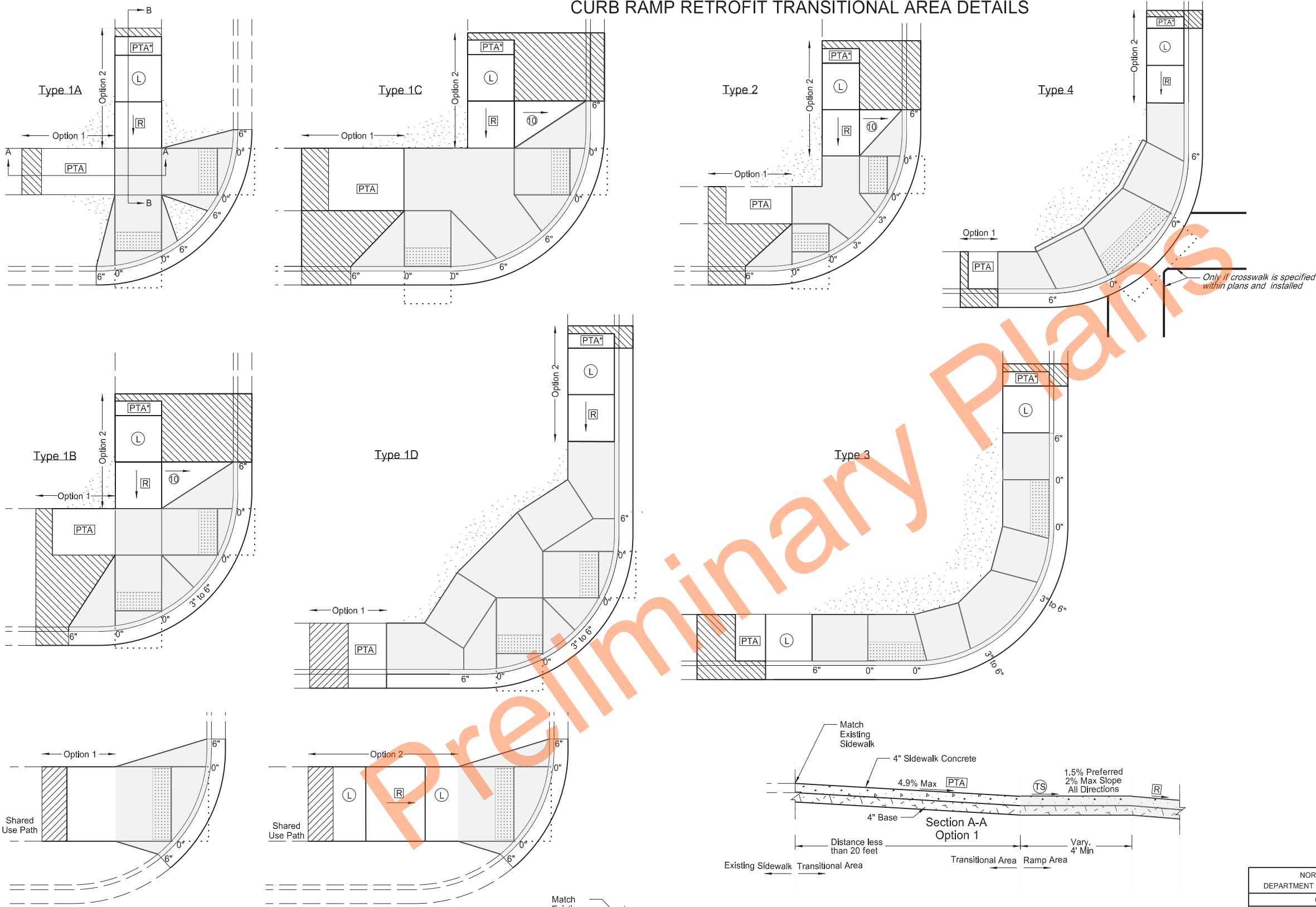
- Detectable Warning Panel.
- Landscaping.
- Transitional tie-in to nearest joint, if needed.
- Curb Ramp Retrofit Transitional Area (See Standard Drawing D750-4)
- 4' long x width of EPF or 4' minimum Clear space outside traffic lanes of travel. 1.5% preferred cross slope 2% maximum cross slope 4.7% preferred running and counter slope 5% maximum running and counter slope
- (TS) : Turning Space Use at top of ramp or when changing directions. 1.5% preferred slope (2% maximum) all directions.
- (R) : Preferred Ramp Grade = 5% to 7.5%. Maximum Constructed Grade = 8.3%. Preferred Cross Slope = 1.5%. Maximum Constructed Cross Slope = 2%.
- (B) : 1.5% preferred cross slope 2% maximum constructed cross slope running slope consistent with the EPF 4.7% preferred max counter slope 5.0% max constructed counter slope
- (10) : 10:1 maximum constructed slope.
- (4) : 4:1 maximum constructed slope.
- 0", 3", or 6" : Curb Height.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-26-13	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice.
09-05-18	Revised Notes, Revision for Turning Space, Added Passing Space Requirements, Turned Detectable Warning Panel
03-15-21	Slope & other clarifications.
05-19-21	Separate Curb Ramp Transition Area from Curb Ramp area

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA
05 19 2021

CURB RAMP RETROFIT TRANSITIONAL AREA DETAILS

D-750-4



Transition Areas for Shared Use Paths

NOTES:

1. Curb Ramp Transitional Areas are to transition from the Curb Ramp area into the Existing Pedestrian Facility (EPF). Each layout shows example transitions. Use any combination for transitions from the Ramp Area into the EPF that allows for similar or gentler slopes to that of the existing condition, yet transitions in the shortest distance possible. In some cases, if grades allow, the Ramp area can immediately transition into the EPF and no transitional area is needed.
2. Option 1: Use this transition when existing running slope grades are less than 5%. Transition from the ramp area to the EPF using the Pedestrian Access Transition Area (PTA) transition rates and in less than 20 feet.
3. Option 2: Use this transition when existing running slopes are greater than 5% and option 1 is not able to be met.

Add a ramp and a landing immediately after the ramp area. Then transition from the compliant landing into the EPF using the PTA rates (preferred), or in less than 15 feet (which ever is shorter).
4. Transitional Areas for Shared Use Paths can be concrete or asphalt.
5. See Curb Ramp Retrofit Details Standard D-750-3 for additional information.

LEGEND:

- [Pattern] : Detectable Warning Panel.
- [Pattern] : Landscaping.
- [Pattern] : Transitional tie-in to nearest joint, if needed.
- [Pattern] : Curb Ramp Retrofit Area (See Standard Drawing D750-3)
- [Pattern] : 4' long x width of EPF or 4' minimum Clear space outside traffic lanes of travel. 1.5% preferred cross slope 2% maximum cross slope 4.7% preferred running slope 5% maximum running slope
- [PTA] : Pedestrian Access Transition Area Running Slope less than 4.9%. Transition Cross Section at 1/2 percent per foot from the from Ramp Area to EPF.
- [L] [TS] : Turning Space/Landing Use at top of ramp or when changing directions. 1.5% preferred slope (2% maximum) all directions.
- [R] : Preferred Ramp Grade = 5% to 7.5%. Maximum Constructed Grade = 8.3%. Preferred Cross Slope = 1.5%. Maximum Constructed Cross Slope = 2% Maximum Length = 15 feet
- [10] : 10:1 maximum constructed slope.
- [4] : 4:1 maximum constructed slope.
- 0", 3", or 6" : Curb Height.

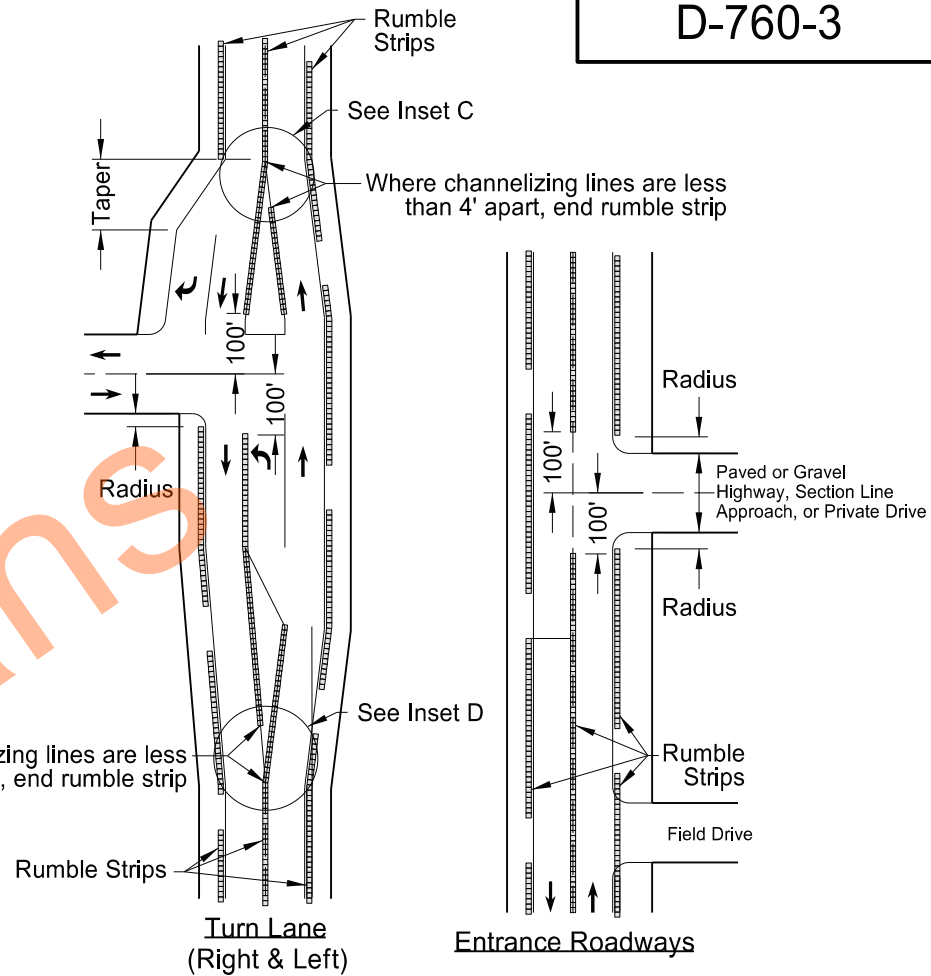
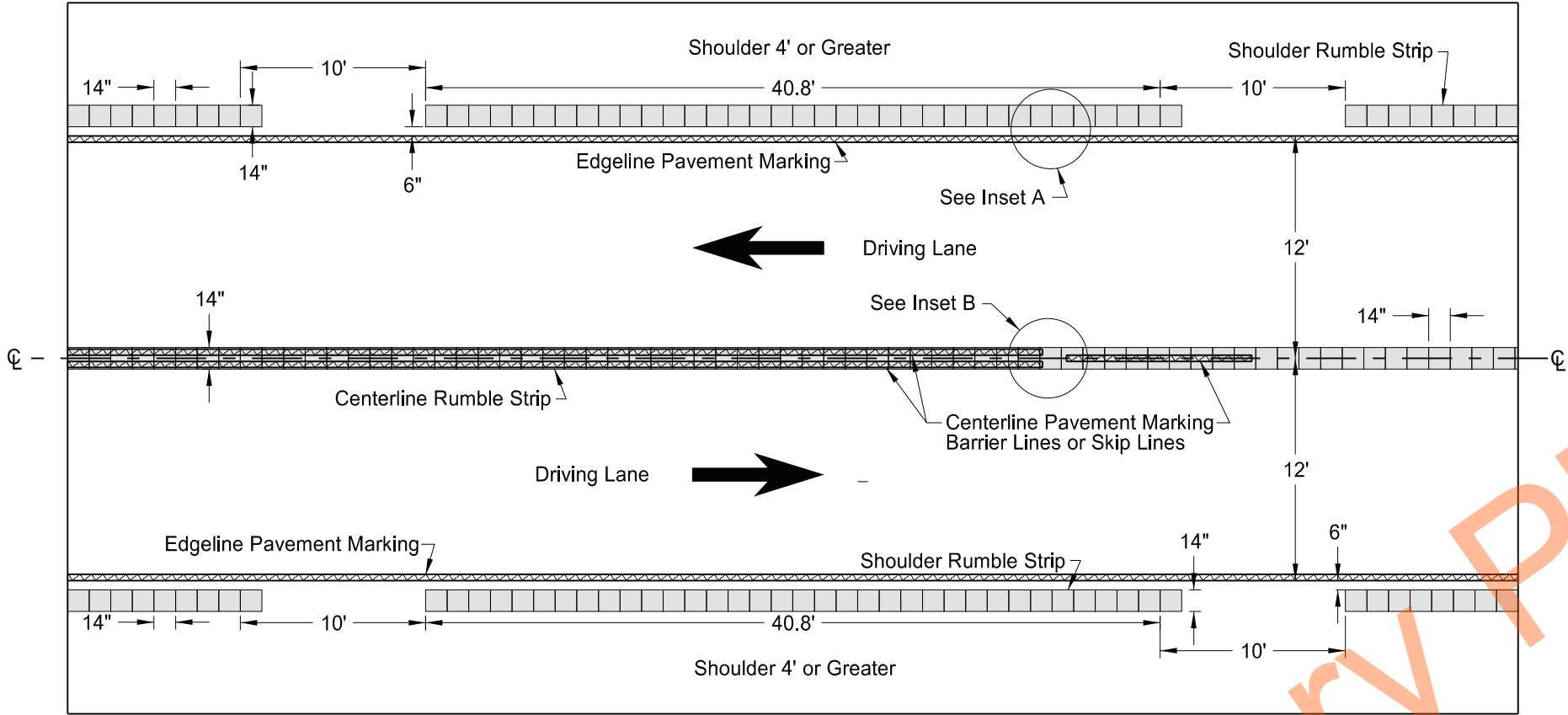
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
05-19-21	
REVISIONS	
DATE	CHANGE



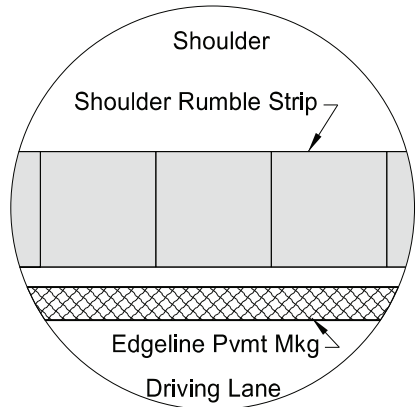
05 19 2021

RUMBLE STRIPS UNDIVIDED HIGHWAYS (SHOULDERS 4' OR GREATER)

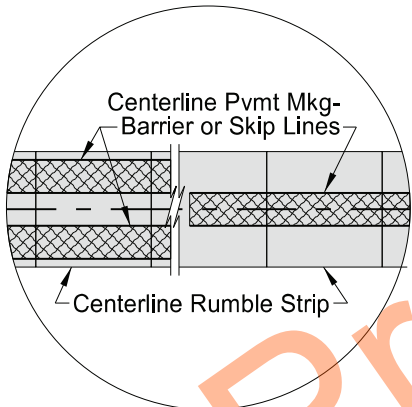
D-760-3



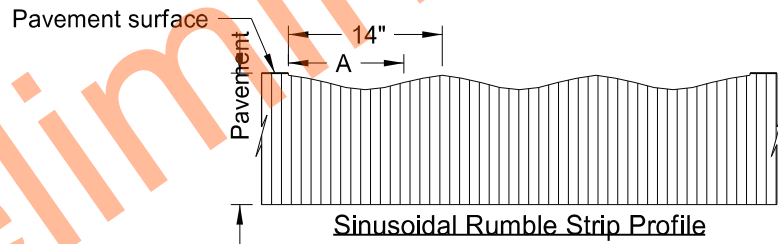
Undivided Highways (Shoulders 4' or Greater)



Inset A - Shoulder Rumble Strip
(Layout for opposite shoulder reversed)

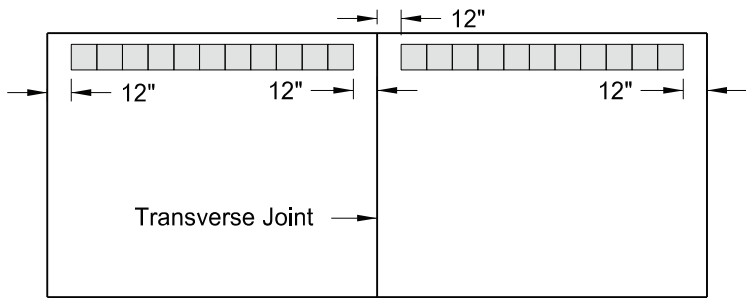


Inset B - Centerline Rumble Strip

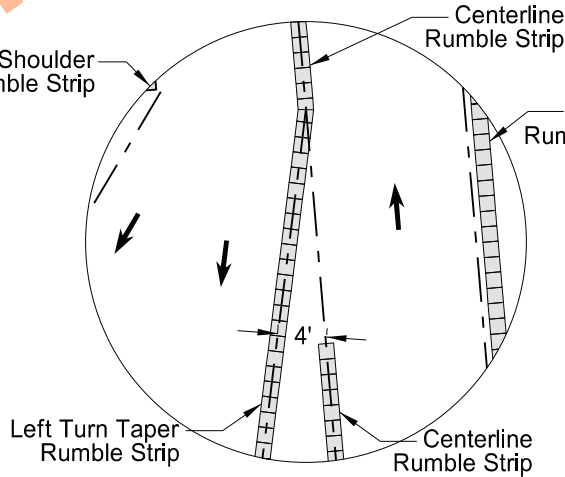


Milling Depths		
Location A (in)	MIL	in
0	62.5	1/16
1 3/4	156	5/32
3 1/2	281	9/32
5 1/4	438	7/16
7	500	1/2
8 3/4	438	7/16
10 1/2	281	9/32
12 1/4	156	5/32
14	62.5	1/16

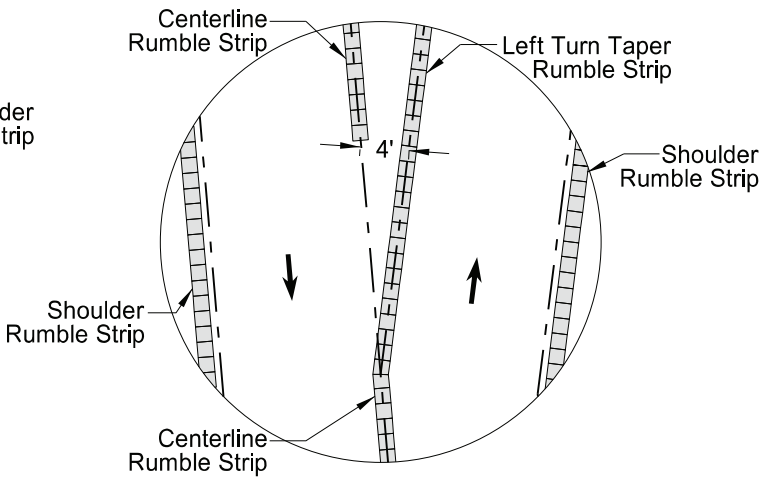
- NOTES:
- 1) Discontinue shoulder rumble strips through the entire length of right turn lanes and tapers, and at the radius of paved or gravel highways, section line approaches, or private drives.
 - 2) Discontinue centerline rumble strips 100' before and after paved or gravel highways, section line approaches, or private drives. Place rumble strips at left turn lanes as shown below.
 - 3) No additional quantity provided for centerline rumble strips on left turn tapers. Include all costs for centerline rumble strips on left turn tapers in the price bid for "Sinusoidal Rumble Strip - Asphalt Centerline" or "Sinusoidal Rumble Strip - Concrete Centerline".



Discontinue rumble strip approx. 12" on both sides of PCC transverse joint



Inset C



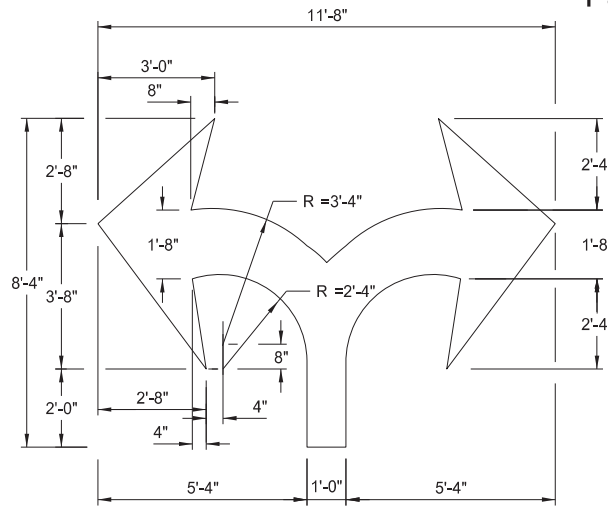
Inset D

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-29-09	
REVISIONS	
DATE	CHANGE
2-25-10	Note 4 was added.
4-19-10	Revised Note 5, Note 6, and Turn Lane (Right & Left).
9-08-11	Revised Notes and D-760-3.
10-25-19	Added missing dimensions.
11-16-21	Changed turn lane rumble layouts.
3-07-23	Added Note 3.
5-26-23	Made rumble strips sinusoidal.



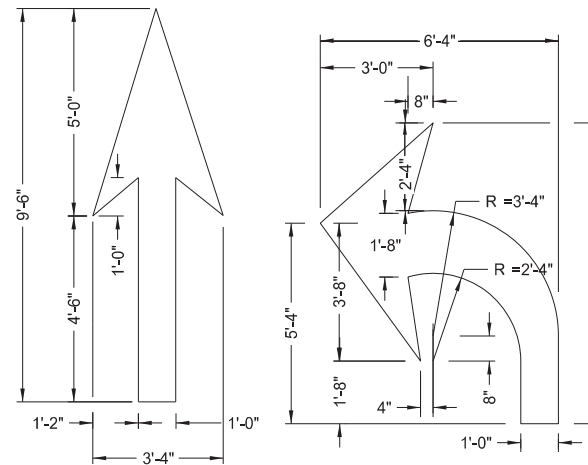
05/26/23

D-762-1



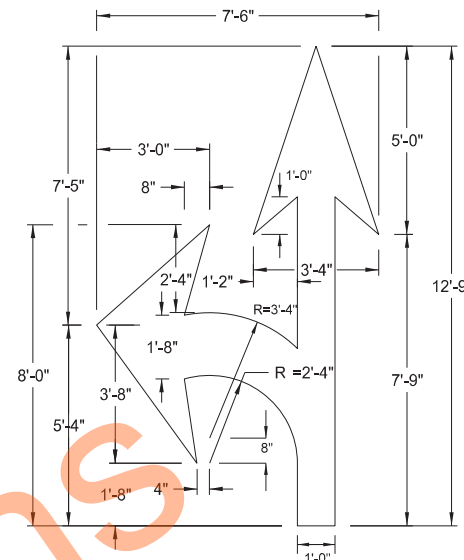
22 S. F.

29 S. F.

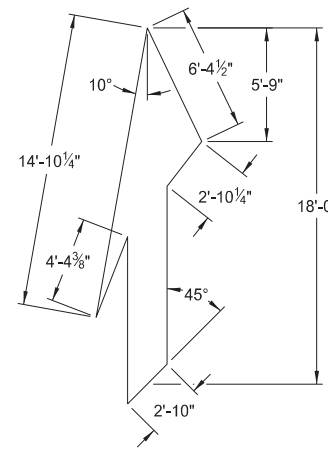


12 S. F.

16 S. F



27 S. F.

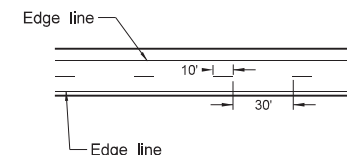


41 S. F.

Note: Rotate merge arrow
20° from edge of roadway.

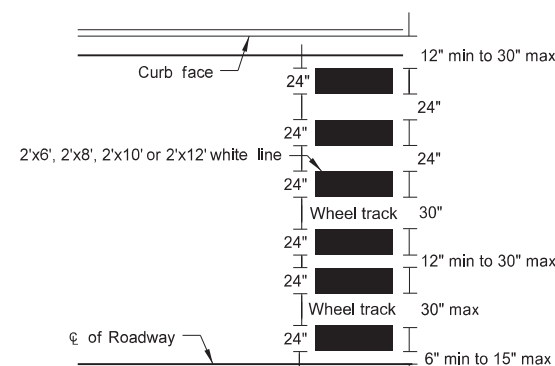
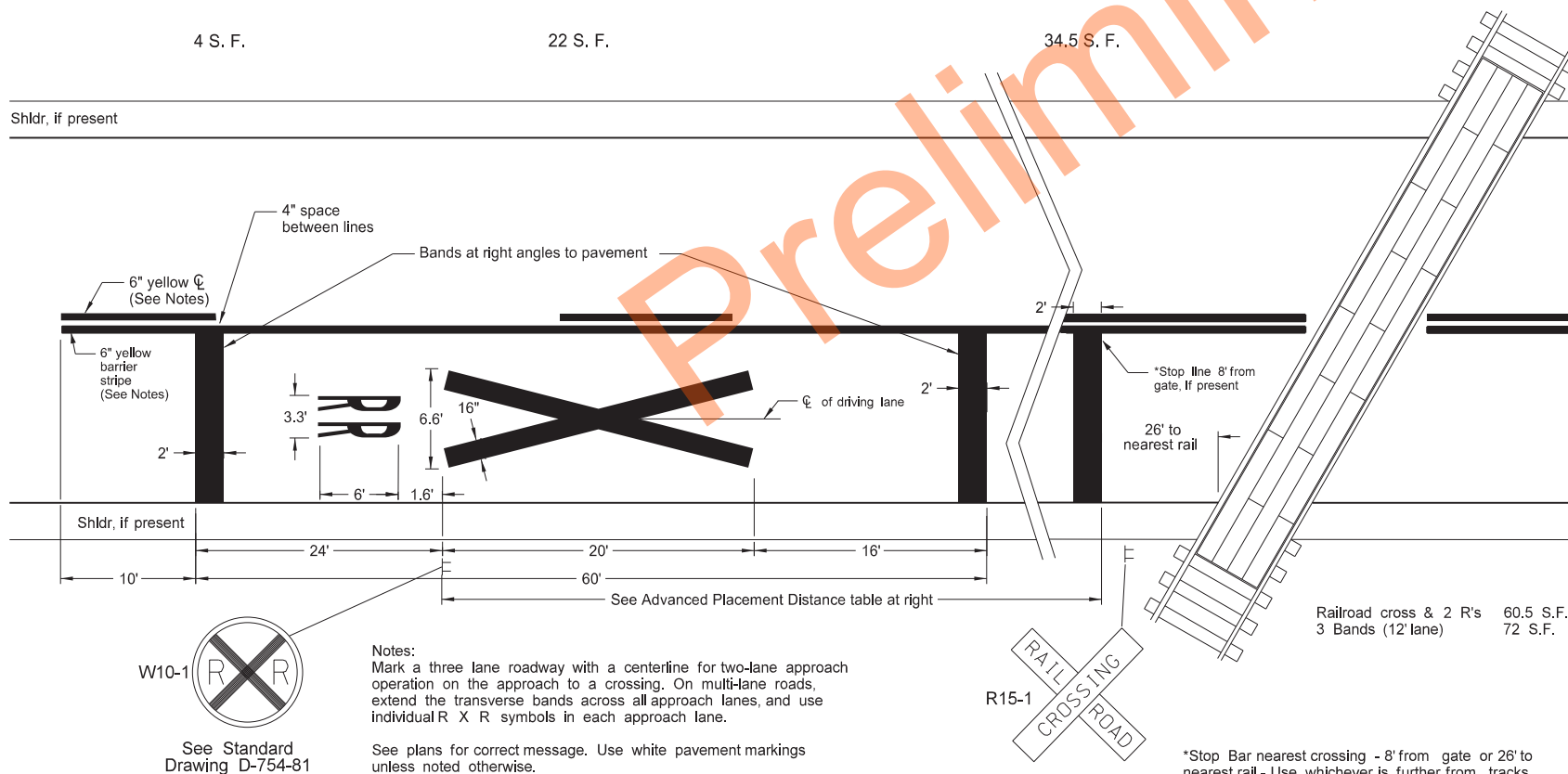
Speed Limit	Chevron Width	Chevron Spacing 45° to Traffic
0-25 mph	8"	5'
30-40 mph	8"	15'
45 mph and above	12"	25'

Chevron Crosshatching Table



Centerline Pavement Marking Skip Spacing Detail

Advance Placement Distance for Railroad Warning Signs	
Posted or 85th Percentile Speed	Advance Distance
20 mph	min. 100 ft
25 mph	min. 100 ft
30 mph	min. 100 ft
35 mph	min. 100 ft
40 mph	125 ft
45 mph	175 ft
50 mph	250 ft
55 mph	325 ft
60 mph	400 ft
65 mph	475 ft
70 mph	550 ft



Continental Crosswalk Detail

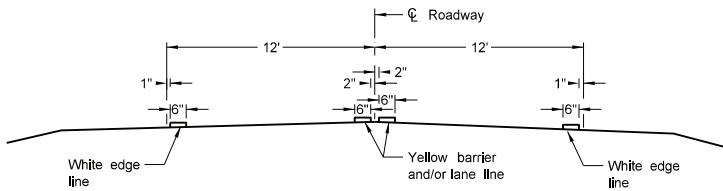
- NOTES:
1. Normal width line - 6 inches wide for freeways, expressways, and ramps; 6 inches for all other roadways with speed limits > 40 mph,
 2. Use 4 or 6 inch wide pavement marking for all other roadways with speed limits ≤ 40 mph.

NORTH DAKOTA	
DEPARTMENT OF TRANSPORTATION	
12-6-11	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice.
08-27-19	New Design Engineer PE Stamp.
01-28-2020	Revised min Stop Bar distance to
11-22-2023	Revised pavement marking widths.

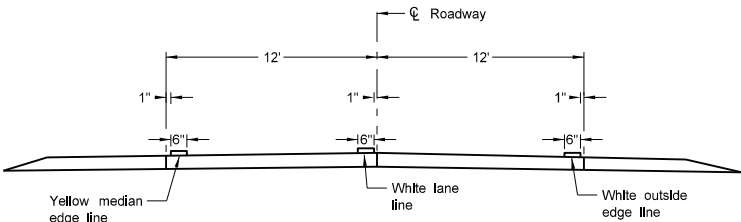


PAVEMENT MARKING

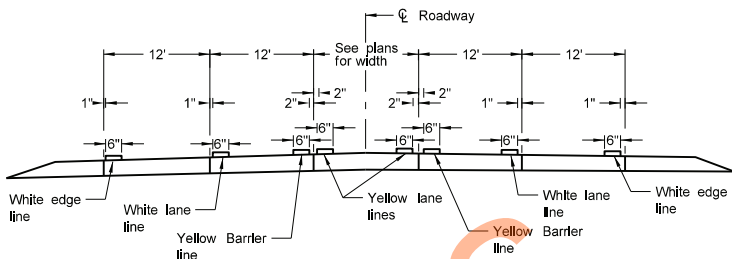
D-762-4



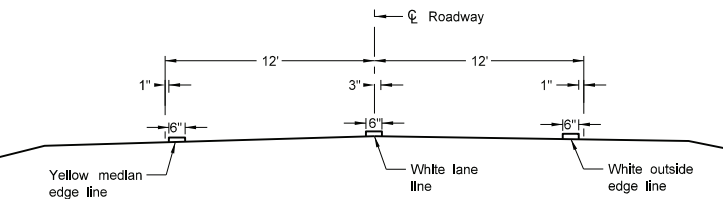
Two Lane Two Way
RURAL ROADWAY



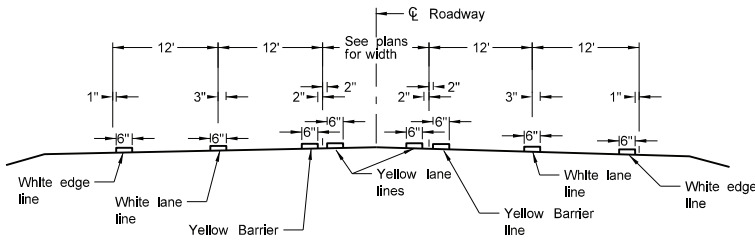
Two Lane Roadway
INTERSTATE HIGHWAY
Concrete Section



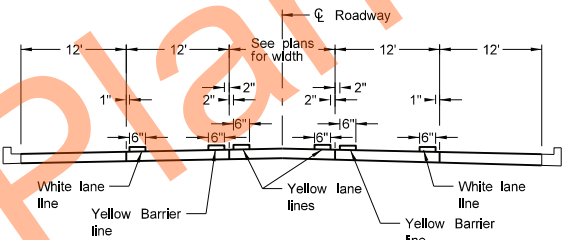
RURAL FIVE LANE ROADWAY
Concrete Section



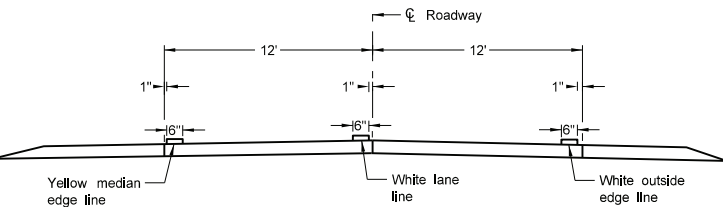
Two Lane Divided
Rural Roadway
PRIMARY HIGHWAY
Asphalt Section



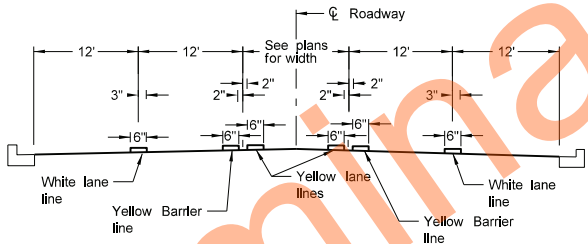
RURAL FIVE LANE ROADWAY
Asphalt Section



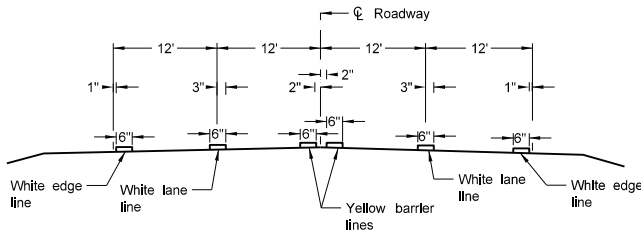
URBAN FIVE LANE SECTION
Concrete Section



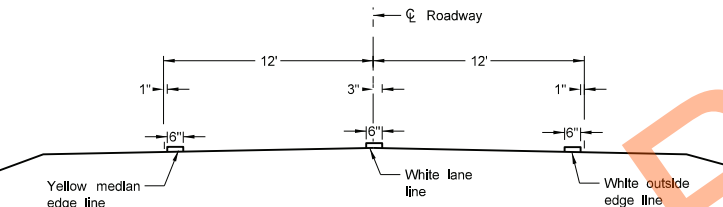
Two Lane Divided
Rural Roadway
PRIMARY HIGHWAY
Concrete Section



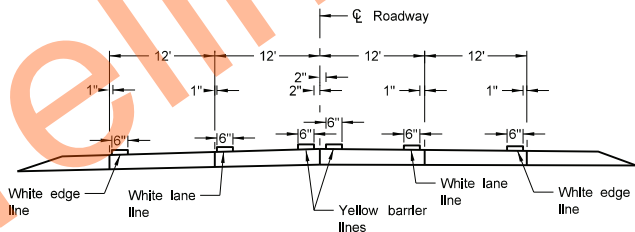
URBAN FIVE LANE SECTION
Asphalt Section



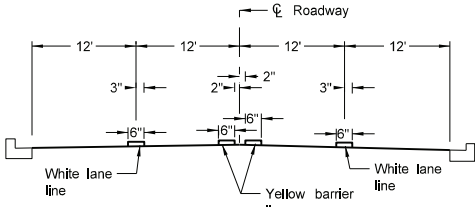
RURAL FOUR LANE ROADWAY
Asphalt Section



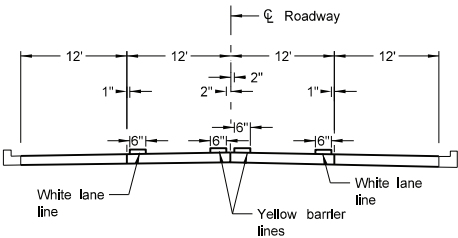
Two Lane Roadway
INTERSTATE HIGHWAY
Asphalt Section



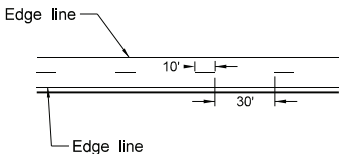
RURAL FOUR LANE ROADWAY
Concrete Section



URBAN FOUR LANE SECTION
Asphalt Section



URBAN FOUR LANE SECTION
Concrete Section



CENTERLINE PAVEMENT MARKING SKIP SPACING DETAIL

NOTES:

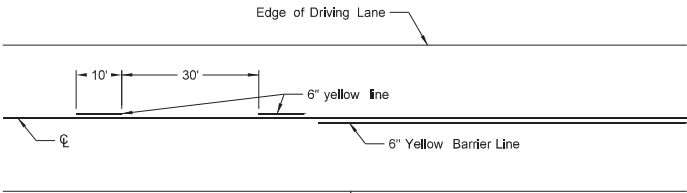
1. Continue edge lines through private drives and field drives. Break edge lines for intersections.
For section lines, county roads, and street approaches, stripe the radii and edge lines of the paved surface within the right of way except where curb and gutter is present.
2. Normal width line - 6 inches wide for freeways, expressways, and ramps; 6 inches for all other roadways with speed limits > 40 mph.
3. Use 4 or 6 inch wide pavement marking for all other roadways with speed limits < 40 mph.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice.
08-27-19	New Design Engineer PE Stamp.
11-22-23	Revised pavement marking widths.
07-09-24	Modified Note 1.

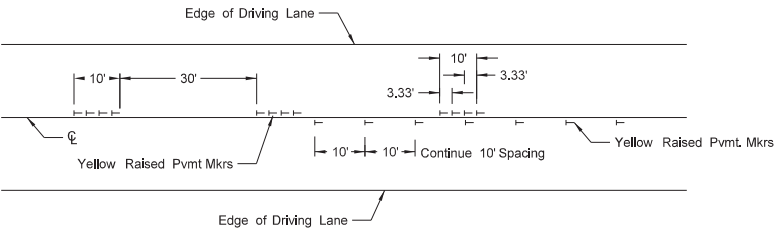


SHORT-TERM PAVEMENT MARKING

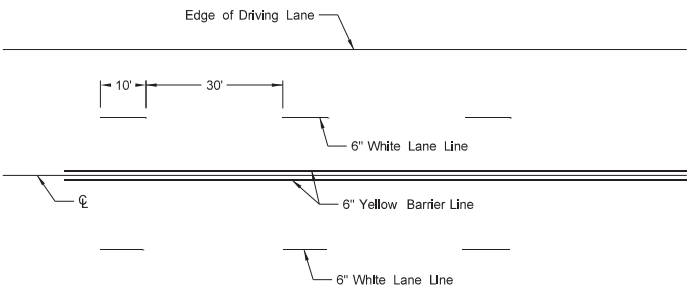
D-762-11



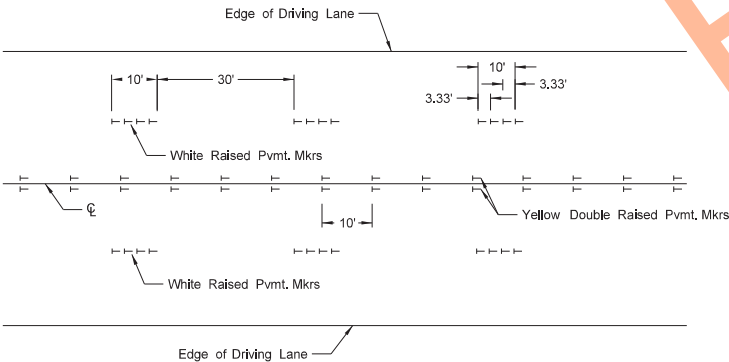
Painted or Tape Lines



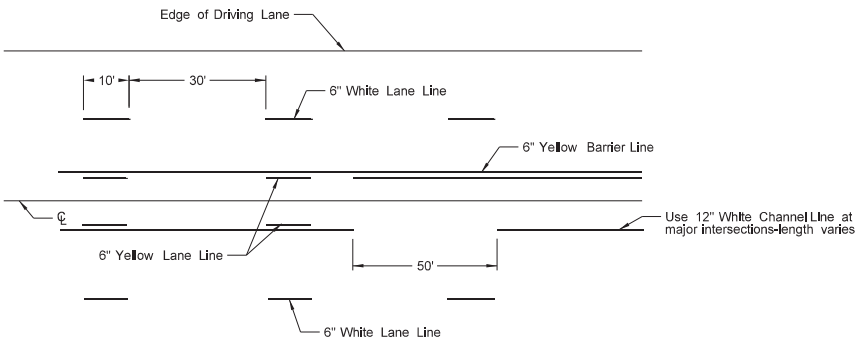
Raised Pavement Markers
TWO-LANE TWO-WAY ROADWAY



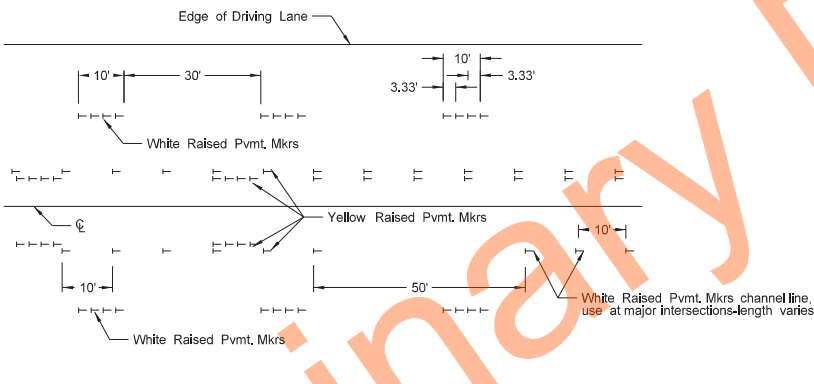
Painted or Tape Lines



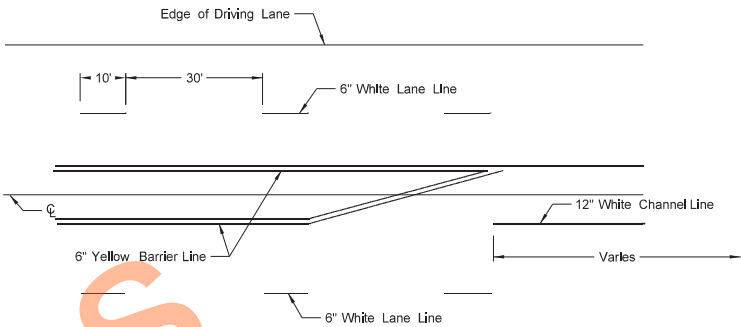
Raised Pavement Markers
FOUR LANE ROADWAY



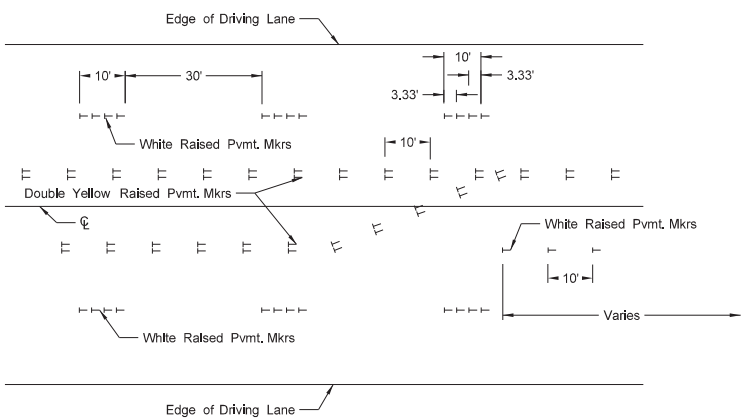
Painted or Tape Lines



Raised Pavement Markers
FIVE LANE ROADWAY TWO WAY LEFT TURN



Painted or Tape Lines



Raised Pavement Markers
FIVE LANE ROADWAY WITH MARKED ISLANDS

NOTES:

1. Place no passing zones on two-lane two-way roadways as shown. In lieu of short term no passing zone pavement markings, place no passing zone signs. Replace no passing zone signs with short term no passing zone pavement marking within three days.
2. Place short term center line stripe (paint) on top lift to match exact placement of permanent stripe.
3. Remove raised markers and tape markings after permanent pavement marking is installed.
4. Normal width line - 6 inches wide for freeways, expressways, and ramps;
6 inches for all other roadways with speed limits > 40 mph.
5. Use 4 or 6 inch wide pavement marking for all other roadways with speed limits ≤ 40 mph.
6. Wide lines - 8 inches wide if 4 inch normal width lines are used and
12 inches wide if 6 inch normal width lines are used.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
3-29-16	Re-numbered to be D-762-11 (previously was D-762-6)
10-17-17	Updated to active voice.
8-27-19	New Design Engineer PE Stamp.
11-22-23	Revised pavement marking widths
1-17-24	Revised wide pvmt marking width.

